ENVIRONMENTAL AUDITING

IN THE CANADIAN

PRIVATE SECTOR

By

John W. Reed

For

Environmental Protection Service
Environment Canada

This report has not undergone detailed technical review by the Environment Protection Service and the content does not necessarily reflect the views and policies of Environment Canada. Mention of trade names or commercial products does not constitute endorsement for use.

This unedited version is undergoing a limited distribution to transfer the information to people working in related studies. This distribution is not intended to signify publication and, if the report is referenced, the author should cite it as an unpublished report of the Environmental Protection Service.

Any comments concerning its content should be directed to:

Mr. A. Stelzig
Industrial Programs Branch
Environmental Protection Service
Environment Canada
Ottawa, Ontario
K1A 1C8

or

R. Baker
External Strategies Branch
Environmental Protection Service
Environment Canada
Ottawa, Ontario
K1A 1C8

IP - 27
February 1985

This paper, "Environmental Auditing in the Canadian Private Sector", is being submitted to the federal Environmental Protection Service as per the conditions of a research contract (Contract No. KE145-3-0992) held with the Faculty of Environmental Studies at York University, Downsview, Ontario. It presents the findings of a nation-wide investigation of Canadian industry's awareness and use of an environmental management practice known as environmental auditing.

A Note of Appreciation

This project simply would not have been possible without the direct participation and assistance from a wide variety of individuals -- far too many to list by name. I wish to extend heartfelt thanks to all those individuals and organizations who took the time to complete the questionnaire and who met with me in personal interviews. Your cooperation, efforts and enthusiasm are greatly appreciated. Thanks also to those individuals who, over the past 18 months, have contributed informally to my understanding of environmental auditing, whether through casual conversation or information exchange. In addition, I would like to extend special thanks to my advisor, Audrey Armour of York University, and to Art Stelzig of the federal Environmental Protection Service. Your confidence and commitment are greatly appreciated.

FORWARD

When first introduced to environmental auditing -- as an employee of a firm developing an environmental auditing program -- the significance of the practice was lost on me. It appeared to me to be just another company program. I quickly realized however, that environmental auditing was a unique, new and innovative practice. It was not just another company program. It signalled the beginning of a more proactive and responsible mode of managing environmental activities within the private sector. And it was a practice that could lead to both private and public benefit.

Following telephone conversations with key individuals in the United States, I soon learned that I was seeing only the tip of an iceberg. Environmental auditing was the beginning of a new wave of management -- its roots were extensive and its momentum increasing. Industries, trade associations, consultants and governments were actually excited about this practice and its future.

In the United States, auditing had made in-roads on all fronts. In Canada, it was suspected that the level of awareness, interest and activity was, relative to the United States, quite low. But, in fact, no one knew for sure. Was this environmental practice used in Canada? How extensively? What were the programs like? These unanswered questions led directly to the conception of this research project -- an investigation of environmental auditing in Canada. From the outset, its primary objectives have been to:

- Develop a comprehensive information base, based on Canadian and U.S. experience, of both the theory and practice of environmental auditing

And, through the transfer of that information,

- Develop an awareness and understanding of environmental auditing throughout Canada, beginning with private industry.

For the purposes of simplification, the project was divided into two phases: Phase One focused on the United States experience with environmental auditing, and formed a substantial part of the information base. Specifically, it addressed

- o The concept of environmental auditing, including its objectives, design, scope, process, and related issues
- o the U.S. private sector application of auditing
- o the U.S. Environmental Protection Agency proposals for the use of environmental auditing as a regulatory tool.

The Phase One final report, "Environmental Auditing: A Review of Current Practice", was released in March, 1984.

Using primary data, Phase Two developed the Canadian information base, addressing the levels of awareness and current use of the practice in Canadian industry, the characteristics of existing programs, and the general attitudes of Canadian firms toward this practice. Information was collected through a nation-wide mailout survey of approximately 116 major Canadian companies representing eleven industrial sectors, as well as personal interviews with over 65 individuals from a variety of organizations in Canada and the United States.

To the best of my knowledge, this pioneer investigation is the first of its kind in Canada. The information and expertise contained in this report is new. If after reading the reports of this investigation, the reader has a better understanding of the concept of environmental auditing and its practice in Canada, then my goal has been achieved.

The author may be contacted directly at the following address given below.

John W. Reed
2320 Gerrard Street East
Toronto, Ontario
M4E 2E1
(416) 690-7725

INTRODUCTION

Au cours des quinze dernières années, nous avons été témoins d'une augmentation sans précédent en matière de lois concernant l'environnement. Aujourd'hui, la structure légale qui touche l'environnement et à laquelle doivent se plier les industries est passablement complexe et il est probable qu'elle le deviendra davantage, à mesure que de nouvelles lois seront élaborées pour faire face au dangers environnementaux actuels et nouveaux. Les lois actuelles concernent l'air, l'eau et les déversements ainsi que la manutention des produits, des matières premières et des déchets. Le public continue d'approuver ces règlements. En 1980, une enquête menée par Roper aux Etats Unis a révélé que 81% des répondants considèrent que l'industrie a une responsabilité envers la dépollution, alors que seulement 40% estiment que l'industrie fait face à ses responsabilités. En 1981, une enquête semblable rapportait que 80% des répondants considèrent que le gouvernement doit s'assurer que l'industrie dépollue l'air et l'eau, fournisse des produits et des services non-dangereux, utilise de la publicité honnête et fasse en sorte que les conditions de travail soient sécuritaires(1).

Aujourd'hui, pour bon nombre d'industries, notamment celles reliées aux produits chimiques, à l'énergie et aux ressources, peu de questions revêtent plus d'importance, pour protéger leur crédibilité et leur viabilité, que celles qui ont trait à l'environnement. Bien que plusieurs compagnies consacrent une plus grande partie de leur ressources à ce domaine, la manière et la compétence avec lesquelles elles dirigent leurs activités environnementales varient beaucoup: certaines le font bien, d'autres moins bien, et d'autres l'ignorent complètement.

La vérification environnementale est maintenant pratiquée par plusieurs compagnies en tant que partie intégrante de leurs méthodes de gestion de l'environnement. Récemment, l'application de cette pratique a rapidement pris de l'expansion dans le secteur privé américain. Aujourd'hui l'idée de ce concept a franchi les frontières du secteur industriel conventionnel et a attiré l'attention des départments du gouvernements, des régulateurs, des associations de commerce, des bureaux de conseillers, des avocats ainsi que des universitaires.

---

(1) Reich, 1983:5

Au Canada, quelques compagnies ont déjà commencé à implanter la vérification environnementale, quoiqu'on ignore le niveau exact d'activité et l'intensité de l'intérêt qu'on y apporte. Ce manque d'information a fait ressortir le besoin d'une enquête sur l'emploi de cette pratique de gestion au Canada. Cette publication "la vérification environnnementale dans le secteur privé Canadien" essaie de combler ce manque d'information de deux façons: d'abord, la première partie "vérification environnementale: une idée" fournit une vue d'ensemble de la vérification environnementale. Le deuxième chapitre, en particulier, couvre les origines de la vérification environnementale, ses objectifs et caracteristiques (par la présentation de sept principes de la vérification environnementale), ses avantages et les étapes nécessaires pour développer un programme de vérification et le réaliser. Entre autres, la vérification environnementale est proposée comme une forme de protection de l'environnement. Cette première partie, par sa nature d'éditorial, s'adresse surtout aux individus et organisations susceptibles de développer et de réaliser des programmes de vérification.

Ensuite, la deuxième partie de cette publication "la vérification environnementale dans le secteur privé Canadian" présente les résultats d'une enquête menée au niveau du pays sur l'emploi de la vérification environnementale par les compagnies privées canadiennes. Le troisième chapitre couvre la méthodologie utilisée et la cueuillette des données. Le quatrième chapitre présente une analyse des données, en discutant du niveau de sensibilisation des compagnies canadiennes vis-à-vis de la vérification environnementale, de son niveau d'emploi actuel et futur, et des opinions et attitudes générales de l'industrie canadienne à son égard. Le cinquième chapitre présente les caractéristiques des programmes de vérification existants, tandis que le sixième chapitre présente les caractéristiques des programmes en voie de planification. Le septième chapitre "Evaluation de la Vérification Environnementale" présente une analyse critique de cette pratique utilisée comme outil pour la protection de l'environnement, telle que vue par le public, le gouvernement et l'industrie privée.

Il est à espérer que cette étude favorisera une meilleure compréhension de la vérification environnementale, de son emploi, de sa raison d'être et de son degré de réalisation au Canada. On espère, en plus, que cette sensibilisation et cette compréhension accrues encourageront l'utilisation de cet outil partout dans le secteur privé canadien, et au-delà. Une utilisation adéquate et responsable de cet outil apportera des avantages tant au secteur privé que public.

Résumé

- La vérification environnementale, telle que perçue par le secteur privé, est décrite dans cette publication. On y rapporte les résultats d'une enquête faite auprès de 116 compagnies, réparties à travers le Canada, en ce qui a trait à leurs connaissance et emploi de cette pratique, à leur attitude vis-à-vis d'une intervention possible du secteur public ainsi qu'aux caractéristiques des programmes existants comme les objectifs, la dotation, les techniques de cueuillette des données, la soumission de rapports et le suivi.

- La vérification environnementale est une procédure interne, formelle, structurée et rigoureuse, utilisée par les compagnies pour surveiller et donner du feed-back sur les forces et faiblesses des divers programmes mis sur pied pour la protection de l'environnement et la santé publique. Ce programme consiste normalement en une série d'examens indépendants des opérations d'une compagnie, concernant plusieurs média, et est réalisé d'une façon systématique et régulière.

- En général, l'enquête a trouvé que l'industrie canadienne avait une attitude positive envers la vérification environnementale. Ce concept est connu de plusieurs et le nombre déjà considérable d'utilisateurs est à la hausse. La majorité des répondants ressentent un besoin pour la vérification environnementale, et considèrent que d'autres compagnies peuvent en profiter et devraient être encouragées à établir des programmes de vérification, et que le nombre d'utilisateurs augmentera durant les cinq prochaines années.

- Quatre-vingt-onze pourcent des répondants à l'enquête avaient déjà entendu parler de la vérification environnementale. Ving-six pourcent d'entre eux (soit 20 compagnies) ont déjà mis surpied des programmes de vérification et 6 autres compagnies envisagent l'implantation d'un tel programme.

- La majorité des répondants sont d'accord à ce que le gouvernement joue un rôle passsif dans cette vérification - soit de promouvoir et encourager son emploi - mais s'oppose à toute participation active qui aurait comme résultat de donner plus de contrôle en matière de protection de l'environnement au secteur public.

- Un pourcentage élevé des répondants vérifient ou revisent les règlements et permis concernant l'air, l'eau et les déchets, les politiques provenant de la direction générale ou du responsable du site, les pratiques de surveillance et de soumission de rapports, l'équipement qui réduit la pollution ainsi que les réactions aux urgences environnementales.

- Les moyens les plus utilisés pour recueuillir les données sont: l'inspection du site, les rencontres avec la direction et les opérateurs, les questionnaires et l'observation.

- L'utilisation sensée de la vérification environnementale aidera à promouvoir et à améliorer la protection de l'environnement et par le fait même profitera au public. Cependant les gouvernements devraient être aux aguets parce que certaines sociétés irresponsables pourraient abuser de la vérification environnementale, en tirer des bénéfices privés et nuire au grand public.

Executive Summary

- The following paper describes a private sector management practice known as "environmental auditing". It reports the results of a recently completed nation-wide investigation of 116 Canadian companies regarding their awareness and use of this practice, their general attitudes towards the potential of public sector intervention, and the characteristics of existing programs such as objectives, staffing, information collecting techniques, reporting and follow-up.

- Environmental auditing refers to internal, formalized, structured and rigourous procedures used by companies to monitor and provide feedback on the strengths and weaknesses of the various programs and activities they employ to protect the environment and public health. An environmental auditing program normally consists of a series of independent multi-media examinations of company operations conducted on a regular and systematic cycle.

- Overall, the survey found that Canadian industries are quite positive about environmental auditing: there is a high level of awareness of the practice, and the already substantial number of users is growing; most respondents felt that there is a need for environmental auditing, that other companies could benefit from and should be encouraged to establish auditing programs, and that the number of firms with auditing programs will increase in the next five years.

- Ninety-one percent of all survey respondents reported that they had heard of environmental auditing before.

- Twenty-six percent of all survey respondents (twenty companies) currently conduct an environmental auditing program; six other companies have plans to implement a program.

- The majority of respondents support the government playing a passive role with regards to environmental auditing -- promoting and encouraging its use -- but are opposed to any type of active government role which places further control over environmental protection in the hands of the public sector.

- The majority of respondents support the government playing a passive role with regards to environmental auditing -- promoting and encouraging its use -- but are opposed to any type of active government role which places further control over environmental protection in the hands of the public sector.

- In terms of scope, a high percentage of respondents audit or review each of: the regulations/permits for air, water, land and waste disposal; corporate and plant level policies; monitoring and reporting requirements and practices; on-site pollution control units; and environmental emergency response.

- The most commonly used means of collecting information are: site inspection; interviews with management and operating staff; use of checklist/questionnaires; and general observation.

- Responsible use of environmental auditing will serve to promote and increase environmental protection and will therefore result in public benefits. Notwithstanding that, governments should be alert to the potential for irresponsible firms to abuse environmental auditing and gain private benefits and produce public disadvantage.

TABLE OF CONTENTS

	Page
PART ONE: Environmental Auditing: A Concept	
1.0 INTRODUCTION	2
2.0 OVERVIEW OF ENVIRONMENTAL AUDITING	5
2.1 Origins	5
2.2 The Term "Audit	7
2.3 Description of Environmental Auditing	8
2.3.1 Environmental Auditing is a Monitoring Mechanism	9
2.3.2 Environmental Auditing Reviews Environmental Protection and Compliance Assurance Activities	10
2.3.3 Environmental Auditing Assists Facility Management and Assures Corporate Management	11
2.3.4 Environmental Auditing Consists of Assessment and Verification	14
2.3.5 Environmental Auditing Must Be Independent	16
2.3.6 Environmental Auditing Must Have Follow-up	17
2.3.7 Environmental Auditing is a Form of Environmental Protection	18
2.4 Environmental Audit Maturation	19
2.5 Reasons to Conduct Environmental Auditing	21
2.6 Conducting an Environmental Audit	22
2.6.1 Audit Organization and Staffing	24
2.6.2 Planning the Audit	26
2.6.3 Pre-Audit Preparation	31
2.6.4 On-Site Investigation	34
2.6.5 Audit Reporting	36
2.6.6 Follow-up and Feedback	39
2.7 Summary	41
PART TWO: Environmental Auditing in the Canadian Private Sector	
3.0 COLLECTION OF DATA	43
3.1 Survey Questionnaire	43
3.2 Personal Interviews	49
3.3 Summary	49

		Page
4.0	SURVEY ANALYSIS	51
4.1	Level of Awareness	51
4.2	Level of Current and Planned Use	52
4.2.1	Current Use	52
4.2.2	Intended Use	54
4.3	Canadian Industry General Opinions and Attitudes	56
4.3.1	Need for Environmental Auditing	56
4.3.2	Benefits to Other Companies	60
4.3.3	Other Companies Encouraged	62
4.3.4	Future of Environmental Auditing	64
4.3.5	Potential Government Initiatives	66
4.4	Summary	77
5.0	CHARACTERISTICS OF EXISTING PROGRAMS	78
5.1	Program Particulars	78
5.1.1	Title	78
5.1.2	Year Established	79
5.1.3	Number of Audits Conducted	79
5.1.4	Responsibility	80
5.1.5	Objectives	80
5.2	Scope of Environmental Auditing Programs	82
5.2.1	Areas of Review	82
5.2.2	Application	84
5.2.3	Audit Frequency	85
5.3	Personnel	85
5.3.1	Outside Consultants	85
5.3.2	Individual or Team	86
5.3.3	Inputs	87
5.3.4	Training	88
5.4	Gathering Audit Information	88
5.4.1	On-site Investigation	89
5.4.2	Audit Preparation	89
5.4.3	Facility Preparation	91
5.4.4	Written Manual	92
5.4.5	Techniques	92

		Page
5.5	Reporting/Follow-Up	93
5.5.1	Oral or Written Report?	93
5.5.2	Primary Addressee	94
5.5.3	Time Lag	95
5.5.4	Types of Information	95
5.5.5	Audit Protection	96
5.5.6	Formal Response	97
5.5.7	Corrective Actions	98
5.5.8	Feedback	109
5.6	Audit Benefits	101
5.6.1	Evaluation Criteria	101
5.6.2	Cost-Savings	102
5.6.3	Other Benefits	103
5.6.4	Compliance Record	103
5.7	Summary	104
6.0	**CHARACTERISTICS OF PLANNED PROGRAMS**	105
6.1	Responsibility	105
6.1.1	Department	105
6.1.2	Level	105
6.2	Objectives	106
6.3	Scope - Areas of Review	107
6.4	Staffing	108
6.5	Gathering Audit Information	108
6.6	Reporting	109
6.7	Follow-Up	109
6.8	Summary	110
7.0	**EVALUATION OF ENVIRONMENTAL AUDITING**	111
7.2	The Public at Large	113
7.3	Private Industry	116
7.4	Government	118
7.5	An Industry Rejoinder	120
7.6	A Verdict?	121
7.7	Unexplored Applications	122
7.8	Summary	124

Page

APPENDICES 127

Appendix 1- List of Companies

Appendix 2- Survey Questionnaire

Appendix 3- Covering Letter

Appendix 4- Description of Environmental Auditing

Appendix 5- Abstract of Phase 1 Report

Appendix 6- Follow Up Letter

SELECTED BIBLIOGRAPHY

LIST OF FIGURES

		Page
2.3.1	Environmental Auditing as Feedback - Hierarchy of Environmental Management	10
2.3.2	Environmental Auditing as a Cross-Section	12
2.3.3	Principal Functions	14
2.3.4	Environmental Auditing Activities	16
2.4	Maturation Process of Environmental Auditing Programs	20
2.6	The Environmental Audit Process	23
3.0	Study Timetable (Phase II)	44
3.1	Flow Diagram of Survey Structure	47

LIST OF TABLES

		Page
2.6.2A	Potential Objectives for Environmental Auditing Programs	28
2.6.2B	Environmental Audit Subjects of Review	30
3.1	Survey Response	49
4.1	Level of Awareness	52
4.2.1	Level of Current Use	52
4.2.2	Intentions Regarding the Use of Environmental Auditing	55
4.3.1A	Need for Environmental Auditing	57
4.3.1B	Need for Environmental Auditing	59
4.3.2	Benefit to Other Companies	61
4.3.3	Other Companies Encouraged	63
4.3.4	Future of Environmental Auditing	65
4.3.5A	Fund Research	68
4.3.5B	Sponsor Environmental Auditing Workshops and Conferences	69
4.3.5C	Act as a Clearing House	71
4.3.5D	Public Endorsement	72
4.3.5E	Voluntary, Incentives-Based Program	74
4.3.5F	Mandatory Program	76
5.1.5	Reported Program Objectives	81
5.2.1	Scope - Areas of Review	83
5.3.3	Inputs to the Auditing Process	87
5.4.1	On-Site Investigation	90
5.4.2	Audit Preparation	91
5.4.5	On-Site Methods	92
5.5.2	Primary Addressee of Report	95
5.5.5	Legal Safeguards	97
5.5.6	Follow-Up	98
5.5.7	Corrective Measures	99
5.5.8	Feedback	100
6.2	Intended Program Objectives	106
6.3	Scope - Areas of Review	107
6.5	On-Site Methods	109

PART ONE

Environmental Auditing: A Concept

1.0 INTRODUCTION

Within the past fifteen years, we have witnessed an unparalleled increase in environmental legislation. Today, the legal framework within which industry conducts its business is quite complex, and it will likely become more so as new legislation is developed in response to existing and emerging environmental hazards. Current legislation embraces air, water and land discharges as well as the handling of products, raw materials and wastes. Such regulation continues to have public support. In 1980, a Roper survey conducted in the United States revealed that while 81% of the respondents felt business had a responsibility to control pollution, only 40% felt that business was meeting its responsibility. A similar study in 1981 reported that 80% of the respondents felt that government must ensure that business clean up its air and water pollution, provide safe products and services, advertise honestly and provide safe working conditions.[1]

Today, many types of industries, particularly chemical, energy and resource-related, recognize that few issues hold greater consequence for corporate credibility and viability than those related to the environment. While many firms are devoting an increasing share of corporate attention and resources in this area, the manner and ability with which firms manage their environmental activities vary widely. Some do it well, some do it poorly. Some don't do it at all.

As part of their overall approach to environmental management, several firms[2] are now applying a practice known as "environmental auditing". In recent years, the use of this practice has spread rapidly in the private sector in the United States. Today, the palatability of the concept has extended beyond the confines of traditional industrial sectors

---

1 Reich, 1983:5.

2 Environmental auditing is appropriate for many types of organizations, whether public or private. But to simplify exposition, terms such as 'company', 'firm', 'corporation' and 'private sector' will be used in this paper to refer to the organization adopting such a program.

and it has captured the attention of government agencies, regulators, trade associations, consulting firms, lawyers and academics alike.

In Canada, select companies have begun using environmental auditing, although the precise level of activity and intensity of interest is unknown. This information gap highlighted the need for an investigation into the use of this management practice in Canada. This paper, "Environmental Auditing in the Canadian Private Sector", attempts to fill this information gap in two ways. First, Part One of this paper, "Environmental Auditing: A Concept", provides an overview of the environmental auditing concept. Specifically, Chapter Two addresses the origins of environmental auditing, its objectives and characteristics (through the presentation of seven tenets of environmental auditing), the benefits of environmental auditing, and the steps involved in developing and implementing an audit program. Among other things, environmental auditing is advanced as a form of environmental protection. Editorial in nature, Part One is largely geared to those individuals and organizations likely to develop and implement auditing programs.

Second, Part Two of this paper, "Environmental Auditing in the Canadian Private Sector", presents the results of a national survey of Canadian private companies' use of environmental auditing. Chapter Three discusses the study methodology and collection of data. Chapter Four presents an analysis of the data, discussing the level of awareness of environmental auditing among Canadian firms, the level of existing and planned use, and Canadian industry's general opinions and attitudes regarding this practice. Chapter Five presents a discussion of the characteristics of existing environmental auditing programs, while Chapter Six addresses the characteristics of planned programs. Chapter Seven, "Evaluation of Environmental Auditing", provides a critical analysis of this practice as a tool for environmental protection as seen through the eyes of the public at large, the government, and private industry.

It is hoped this study will promote a better understanding of what environmental auditing is, how and why it is used, and the status of an practice in Canada. Furthermore, it is hoped that this increased awareness and understanding will encourage the use of this tool

throughout the Canadian private sector and beyond. For if used properly and responsibly, this tool can result in both private and public benefits.

2.0 OVERVIEW OF ENVIRONMENTAL AUDITING

As described in this paper, corporate environmental auditing refers to internal, formalized, structured, and rigorous procedures used by private companies to monitor and provide feedback on the strengths and weaknesses of the programs, procedures and activities they employ to protect the environment and public health. An environmental auditing program consists of a series of in-depth, multi-media examinations of company operations that are conducted on a systematic and regular cycle. In other words, it typically involves a team of independent and objective company personnel who go from site to site on some pre-established basis doing a comprehensive internal review of environmental control. Environmental auditing does not refer to to single-purpose, one-time, "firefighting" audits such as "Noise Audits", "Waste Characterization Studies", or "Trace Element Surveys". Nor does it refer to plant level, day-to-day monitoring, sampling, recordkeeping, reporting, or training.

2.1 ORIGINS

The precise origin of environmental auditing is not easily identified. There were two general forces which led to its conception and application. The first was a function of industry's changing attitude towards environmental protection; the second was a direct result of government intervention.

In response to increasing public concern for environmental degradation in the late 1960s and early 1970s, many firms began to recognize their social and legal responsibilities to conduct business in an environmentally acceptable manner. Internal auditing was an effective means of monitoring performance and ensuring uniform practices in other areas of corporate activity, such as internal financial auditing, safety auditing, and quality control, and it seemed only logical that it would be equally useful in the environmental control area. Indeed, it was seen as a natural progression towards a more sophisticated and proactive mode of management. The need for auditing in this area was especially acute as

emphasis in environmental control shifted from one of initial installation of pollution control devices and equipment to one of ongoing operation and maintenance of such equipment.

The crystallization of environmental auditing into a formal corporate program is perhaps best traced to the activities of the United States Securities and Exchange Commission (S.E.C.). Between 1977 and 1979 S.E.C. required three companies -- Allied Chemical, United States Steel, and Occidental Petroleum -- to conduct major corporate audits to fulfill their responsibilities to disclose material effects related to environmental compliance. Potential investors were granted a right to know the amount of current and future expenditures necessary to comply with environmental regulations and the amount of fines and penalties faced by the corporation in existing enforcement proceedings.[1]

Since that time, the use of environmental auditing has grown steadily in the United States private sector. Users include a host of companies from the traditional Manufacturing, Petroleum, Chemical, Pulp and Paper, Utility, Automotive and Steelmaking industrial sectors. In addition, several 'non-conventional' users, such as the U.S. National Institutes of Health (a biomedical research institution), the United States Air Force, and the Department of Energy[2] have established auditing programs. Though considerably less extensive in Canada, industrial users here include Chemical Manufacturing, Petroleum, Pulp and Paper, Automotive, Mining and Steelmaking.

Government agencies and regulators have also expressed an interest in private sector environmental auditing -- some quite actively. Over the past few years for example, the United States Environmental Protection Agency, has proposed various program initiatives which sought to gain public benefit from private auditing efforts. The first scheme, similar in structure to external financial auditing, would have mandated the

---

1 Penna, Richard. 1983:16.

2 See the Environmental Audit Letter, May 1983, September 1983, and November 1983.

use of third party, certified environmental auditors. The second scheme was to have offered certain incentives to firms in exchange for them developing auditing programs. The current initiative is a passive one consisting of endorsement, analysis and assistance.[1,2]

Since its earliest application, the goals and functions of environmental auditing have expanded. No longer restricted to simply monitoring environmental performance, it is used effectively as a line management tool, an education tool, a training tool, and a communication tool. Many firms, in both the United States and Canada, are developing environmental auditing programs as part of their overall approach to environmental management and compliance assurance.

2.2 THE TERM "AUDIT"

There is a tremendous reluctance on the part of some firms to use the term "audit" as part of the program title. Many associate the term with external financial auditing[3] and thus find its use inappropriate in the environmental context. The term "auditing", so the argument goes, implies a degree of precision and standardization which is lacking in environmental applications. There are after all, no "generally accepted environmental auditing principles". In these instances, program titles include "Environmental Surveillance", "Environmental Review", "Environmental Assessment", "Environmental Survey", and so on. Other companies use the term "audit" in the program title deliberately to lend credibility to their program. For other companies still, the program title is selected somewhat arbitrarily.

---

1 Palmisano, 1983.

2 For further description of the U.S. E.P.A. proposals, see: Reed, John W. 1984:106-118.

3 External or independent financial auditing refers to the objective and independent examination of financial statements and activities of publicly owned corporations by a Certified Public Accountant (C.P.A.) in order to determine their fairness, integrity and authenticity. The C.P.A. must be satisfied that the statements fairly present the company's financial position and that they were prepared in conformity with "generally accepted accounting principles" applied consistently with those in the previous year.

The term "auditing" remains the most commonly used one in written articles, correspondence and informal conversation. Ironically, even by those who avoid its use in the program's title. The term "auditing" is favoured in this paper for two reasons. First, because of the above, its use best facilitates the further communication of ideas and knowledge (and avoids further confusion). Second, and more important, the author believes the term "audit" is an appropriate, descriptive and accurate one.

2.3 DESCRIPTION OF ENVIRONMENTAL AUDITING

The notion of facility and program reviews is not new. Any firm with more than two organizational layers must in one form or another monitor performance and detect where problems might arise. In the broad sense, corporate environmental auditing refers to internal activities conducted by a firm to review its own operations and evaluate its own environmental performance. Conceptually, environmental auditing is comparable to other types of internal auditing, and is used in a manner similar to internal financial auditing, management auditing, safety auditing, and quality control: it provides a systematic and regular check on ongoing practices. Procedurally and functionally, it is perhaps most similar to corporate safety auditing.

In substance and practice, however, environmental auditing is unique. It's focus is on a firm's environmental protection and compliance assurance[1] activities.

The following discussion, presented in the form of seven tenets of environmental auditing, elaborates further on the author's conception of what it is, how it works and why it is used.

---

[1] Compliance assurance describes the various systems and controls used by a firm to determine, achieve and sustain compliance with applicable environmental regulations, corporate policies and good operating practices. While it includes activities and mechanisms conducted at the corporate or division level, it refers largely to practices, programs and mechanical devices employed at the plant level to protect the environment and public health.

2.3.1 Environmental Auditing is a Monitoring Mechanism

Environmental auditing is the monitoring or feedback function of a firm's overall environmental management system. (See Figure 2.3.1) It is a form of managerial control which measures and evaluates the effectiveness and adequacy of other components in the management system. Through diagnosis, auditing can identify strengths and weaknesses in existing controls and procedures. Prime focus is normally on the responsibility, authority and accountability for environmental control, the implementation of control procedures and programs, and the operation and maintenance of such procedures, but auditing also extends through to management commitment and goal formulation.

Normally, environmental audits are conducted by divisional or corporate personnel on a company's operating facilities.[1] Upper management sets priorities for the corporation as a whole with respect to environmental performance, corporate, division and plant personnel devise and implement means to meet those priorities, and the audit monitors and evaluates the performance of specific operating facilities, or the performance of entire operating divisions and companies, with respect to the overall priorities.

Though a critical function, environmental auditing is only one of several components in the overall management hierarchy: It is not a panacea. It does not replace or substitute for day-to-day compliance assurance activities such as monitoring, record-keeping, reporting, training and maintenance, anymore than safety auditing replaces programs and practices employed to create safe working conditions. Auditing, by definition, serves as a check on such day-to-day activities.

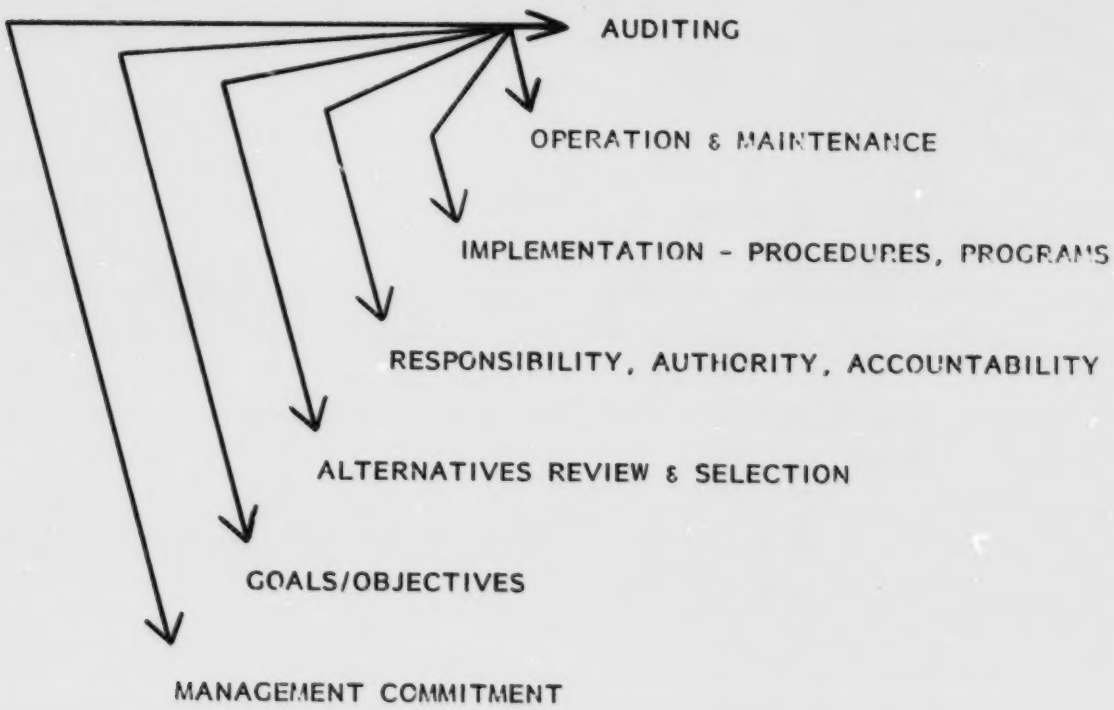
The presence of a corporate environmental auditing program does not by itself guarantee the responsible management of environmental activities, just as financial auditing does not assure sound financial management and safety auditing does not assure safe working conditions.

---

[1] Operating facilities will vary from industry to industry. They could include plants, refineries, wells, mines, mills, marketing terminals, generating stations, and many others.

Sound environmental management results from effective systems and procedures employed throughout the company at its operating facilities, or across operating companies.

FIGURE 2.3.1 — ENVIRONMENTAL AUDITING AS FEEDBACK - HIERARCHY OF ENVIRONMENTAL MANAGEMENT



2.3.2 Environmental Auditing Reviews Environmental Protection and Compliance Assurance Activities

In terms of specific areas of review, Figure 2.3.2 illustrates that environmental auditing provides a cross-section or snap-shot of various procedures, controls, programs and information streams existing within the corporation. For example, it examines monitoring, sampling, recordkeeping

and reporting requirements for air, water and land, employee training and awareness, contingency planning, internal organization, on-going maintenance, and other areas. The audit results in a measurement of compliance with regulations and company policies, of good management practices, of management effectiveness, and of overall environmental performance.

This broad range of environmental data can be transmitted vertically throughout various levels of management, including operations (plant), administrative (division, corporate) and senior corporate (top, upper). Each level processes and converts the data into different types of information[1] according to its function, needs and concerns. This information generated satisfies several concurrent information requirements throughout the corporate hierarchy and supports decision making at all levels.[2]

Conceptually, environmental auditing can be described as a tool for the gathering, evaluation, communication and use of environmental information. Individual corporate environmental auditing programs will vary with respect to the type and depth of information collected, why it is collected, who it is gathered for, and how it is used.

2.3.3 Environmental Auditing Assists Facility Management and Assures Corporate Management

The information generated during an environmental audit has several uses. Two stand out from the rest.

(i) Assists Facility Management

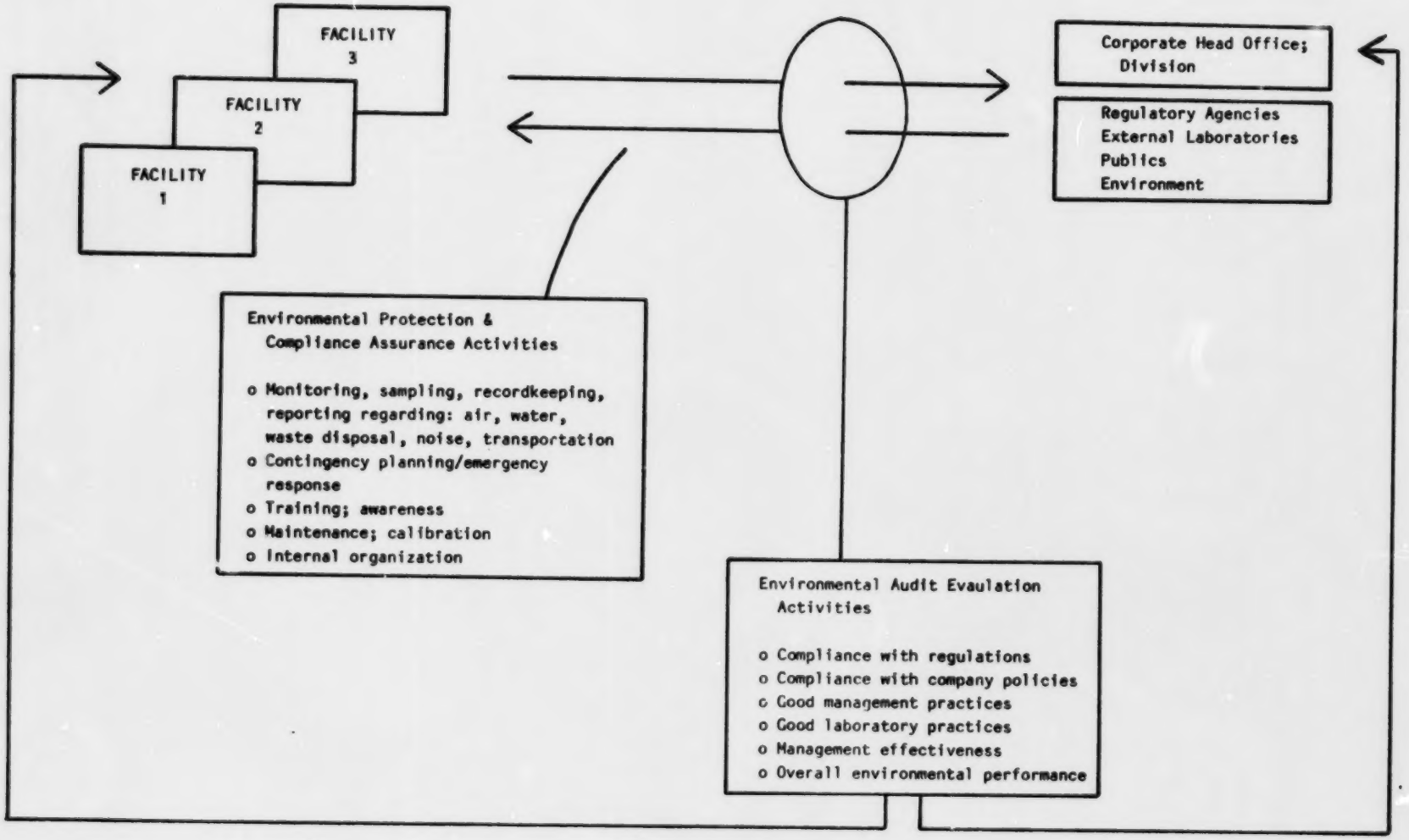
The notion of "fresh eyes" is one of auditing's most positive features: it provides the facility management with an appraisal of local

---

1 Information is selected and interpreted data.

2 Information developed through an auditing program should be integrated with risk assessment, compliance assurance, environmental impact assessment and other environmental information pools. At the next level, environmental information should be integrated with operations, production, financial, social, and other corporate considerations.

FIGURE 2.3.2 — ENVIRONMENTAL AUDITING AS A CROSS-SECTION



operations as seen through the eyes of an outsider. Facility management, concerned with routine, day-to-day operations, may develop "tunnel-vision" over time and may not see the forest for the trees so to speak. Outside auditors can generally take a broader, long-term perspective and may pick up on things unnoticed or considered unimportant by plant personnel. Facility managers can use this new information to improve overall performance.

Assistance may also be rendered through increased education of managers and line personnel regarding, for example, environmental regulations, management and control practices, operating procedures, long term trends, and corporate philosophy. Corporate management can also assist in the design of corrective measures for any identified deficiencies.

(ii) Assures Corporate Management

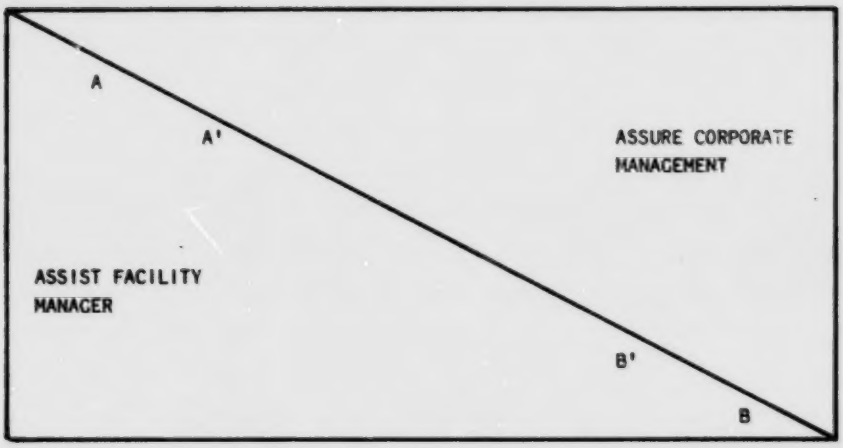
By verifying compliance with regulations and policies, and by monitoring overall environmental performance, environmental auditing also assures corporate manager's, President's and Chief Executive Officer's that environmental activities throughout the corporation are, or are not, being managed in a uniform, effective, responsible and legal manner. In addition, up-to-date, thorough information provides a solid base for decision-making, for negotiations with regulators, and for public relations.

Figure 2.3.3 illustrates that conceptually, an environmental auditing program can be designed to address both goals to varying degrees: they are not mutually exclusive. A good program will be designed to achieve both objectives.

Programs at A' and at B' will possess different characteristics in terms of who the major clients are, how the information is gathered, who gathers it, when and how it is reported, and what action and follow-up is required. Several (but not all) programs in the U.S. private sector would be positioned near B' on the AB continuum. Born out of the need to satisfy senior management's concerns, U.S. programs put a greater emphasis on assuring corporate management than on assisting facility management, performing a "checking up on", "looking over the shoulder",

"policing" type of role. By contrast, many programs encountered in the Canadian private sector put an equal or greater emphasis on assisting facility management than on assuring corporate management. (Around A' on the AB continuum.) The reasons for this lie partly in the differences in regulatory regimes in the U.S. and Canada. In Canada, the motivation for "policing" is perhaps not as great.

FIGURE 2.3.3 — PRINCIPAL FUNCTIONS



2.3.4 Environmental Auditing Consists of Assessment and Verification[1]

Environmental auditing consists of two basic activities:

(i) Assessment

Assessment refers to the audit team's professional judgement or opinion regarding the adequacy and effectiveness of environmental controls as well as the existence and magnitude of environmental hazards. Assessment is a basic activity of any environmental auditing program,

[1] Arthur D. Little, 1983:8.

addressing questions such as: Do existing systems meet the firm's information requirements? Are appropriate people notified in a timely manner in the event of an emergency or excursion beyond regulated limits? Are corporate and plant policies effectively communicated to line personnel? Are training programs adequate? What kind of risks are present or likely to emerge?

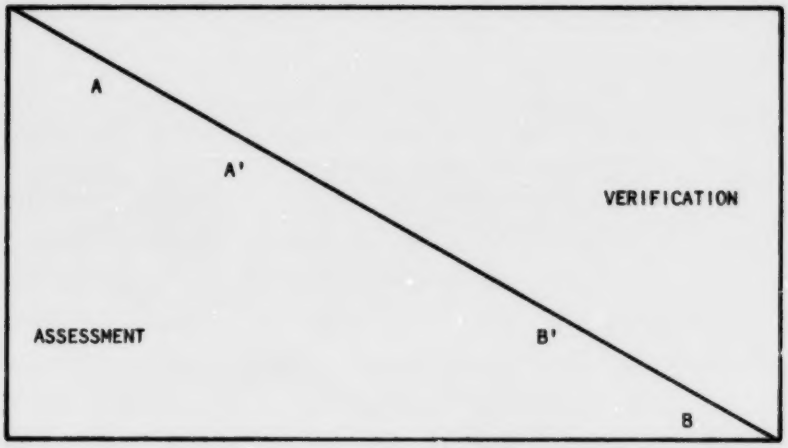
(ii) Verification

Verification refers to the empirical testing of the facility's performance. Specifically, it is an attempt to demonstrate and validate compliance with environmental regulations, the accuracy of environmental data and reports, and the adherence to corporate policies, procedures and good management practices. Verification tests might include the tracing of a report through the corporate hierarchy, an examination for accuracy of existing records and data, physical inspection of operating facilities or the analytical testing of end-of-the-pipe discharges in independent laboratories.

The results of verification tests can and do have a significant bearing on the assessment rendered by the audit team. For example, compliance with regulations provides an indication of the adequacy of environmental controls. This suggests a direct relationship between verification (independent variable) and assessment (dependent variable).

An effective environmental auditing program will blend assessment and verification, though not necessarily equally. Referring to Figure 2.3.4 (below), most companies' auditing programs tend to be in the area of A' on the AB continuum, with assessment forming the bulk of auditing activities. Some companies employ no verification at all, as it generally raises the time and cost of conducting an audit. The degree of verification in an environmental auditing program can be one indication of its sophistication and maturity.

FIGURE 2.3.4 — ENVIRONMENTAL AUDITING ACTIVITIES



2.3.5 Environmental Auditing Must be Independent

To maximize its effectiveness, utility and credibility, the environmental audit must be an independent and objective analysis. Independence is required in order to verify the accuracy of monitoring data and records as well as the effectiveness of local procedures. More important, it is critical to the concept of "fresh eyes". Measures should be taken to ensure that auditors are given, and are seen to be given, independence within the corporate structure. They must be independent of the activities which they audit -- both in fact and in mind. Ways that independence can be enhanced include:

- o Use of outside auditors, such as: corporate personnel, division personnel, individuals from other manufacturing locations, or external consultants.
- o The objectives and purpose of the program and the responsibility and authority of the auditors clearly articulated by senior management.
- o Auditors not allowed to review their own areas of responsibility.

Independence does not preclude the involvement of line personnel. Indeed, the more line personnel are included in decisions regarding which areas of performance are to be audited, how the information is to be gathered and to whom the information is to be given, the more helpful and effective the auditing function will be. Without such cooperation, the 'traditional' tension between auditors and auditees may be nurtured, resulting in dysfunctional consequences such as the hiding of problems or the distorting of information.[1]

2.3.6 Environmental Auditing Must Have Follow-up

Follow-up and feedback procedures are the cornerstone of effective environmental auditing. Such procedures should provide for the following post-audit activities:

- o Design, development and review of corrective measures for identified deficiencies ('action plans').
- o Implementation of such action plans.
- o Monitoring and evaluation of implemented corrective actions to determine adequacy and effectiveness at achieving desired outcomes.
- o Communication of significant findings throughout the corporation to ensure that similar discrepancies are avoided elsewhere in the company.

Follow-up and feedback procedures should be formalized and the role and accountability of appropriate constituencies clearly established. This is necessary for several reasons.

First, it is the socially responsible thing to do. Failure to respond to identified deficiencies is inconsistent with the proclaimed desire to be socially and environmentally responsible. While environmental auditing programs signal corporate responsibility, such responsibility cannot simply be claimed, it must be demonstrated.

---

[1] Schein, 1969:142.

Second, it is the legally responsible thing to do. Penalties associated with knowing non-compliance are more severe than those with unwitting non-compliance. Moreover, failing to address an identified problem is suicidal -- it could constitute negligence and expose the corporation and its officers to substantial liability if such a problem were to become a public health or environmental hazard.

Finally, unless corrective measures are developed and implemented, and unless such measures are effective, there will be no improvement in this status of compliance with environmental regulations, in the effectiveness of environmental protection programs, or in the overall environmental performance of the facility. There will be no benefit to the environment or public health.

2.3.7 Environmental Auditing Is a Form of Environmental Protection

Environmental auditing appears to present a convergence of private and public interest. The benefits of auditing to the firm have already been alluded to, and will be discussed further in the next section. But environmental auditing also has the potential to result in public benefits, by increasing the level of protection afforded to the natural environment (or conversely, by reducing the impacts of industrial activity on the environment).

Environmental auditing will result in increased environmental protection to the extent that it results in an improvement in the adequacy, efficiency and effectiveness of a company's existing environmental protection and compliance assurance activities. In theory, it can accomplish this by increasing the number and type of environmental problems or deficiencies identified (for example, non-compliance incidents, faulty equipment, inadequate practices, or risks), by increasing the certainty and speed with which corrective measures will be designed and implemented, and lastly, by providing mechanisms by which the effectiveness and appropriateness of implemented control measures can be evaluated.[1]

---

[1] Clark, 1984.

Benefits to the environment are not the result of having conducted an environmental audit, as such, but of the follow-up actions and activities taken as a result of the information produced. Ultimately, these actions are the real measure of increased environmental protection. They might include:

- o A reduction in the total number, severity and frequency of non-compliance incidents.
- o An improvement in the efficiency and/or effectiveness of pollution control equipment and facilities.
- o The adjustment and correction of inadequate practices or procedures.
- o The identification and management of environmental risks and the detection and prevention of environmental surprises and sudden events.
- o Better preparation, anticipation and response to actual emergency and crisis situations.

In addition, the mere knowledge that an audit is to be done may generate preventative action and good housekeeping.

Whether, and to what degree, environmental auditing actually functions as an environmental protection tool in practice, will be discussed in Chapter 7.

2.4 ENVIRONMENTAL AUDIT MATURATION

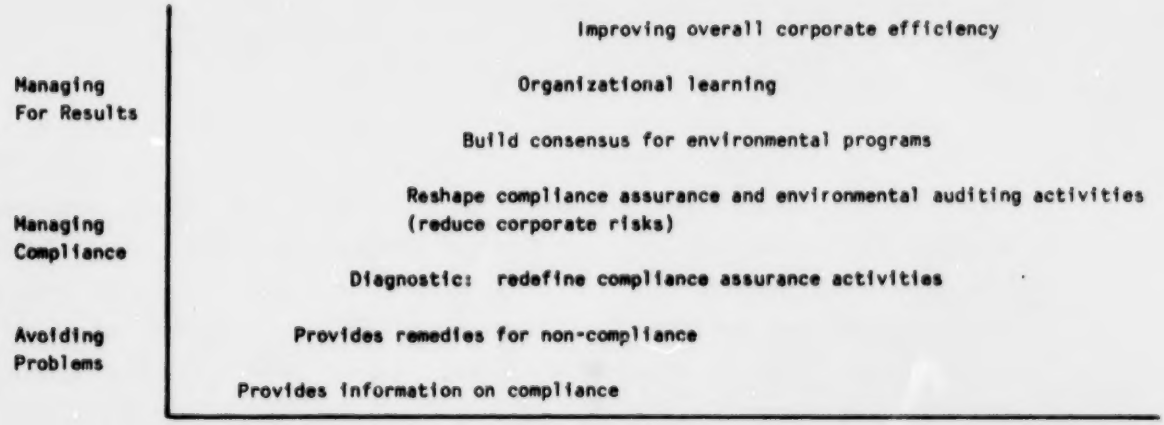
Environmental auditing is an emerging and fluid process; its structure and procedures are continually evolving and being redefined. Reasons for developing an environmental auditing program vary. Often, the immediate goal of an auditing system is reactive -- to identify problems, correct problems, or respond to an environmental emergency. As familiarity with the program increases, higher level goals are pursued. Palmisano observes:

> An audit system will change over time. All systems evolve. Auditing activities, whether initiated in-house or by consultants, will evolve to higher levels of sophistication. Auditing programs, therefore, should

be developed with an understanding that uses and demands on the system will mature.1

Figure 2.4 illustrates that as a firm's environmental management philosophy moves from one of reactive problem solving to one of proactive anticipation, the uses and goals of auditing change as well. When the firm is in a "problem solving" mode, auditing is used as a means of documenting the compliance assurance activities and the existing compliance status. The principal focus is on regulated or managed environmental hazards for which standards of performance already exist. Firms will use audits to identify problems or "fires". As management philosophy progresses to a more proactive mode, the firm begins to set its own performance standards for environmental hazards and manage against them. Auditing becomes more diagnostic and expands its focus to address even those known environmental hazards for which standards do not necessarily exist. Eventually, audit information is integrated at higher levels becoming a means for organizational learning and improving overall efficiency. Auditing programs seek to identify and anticipate unknown or future hazards.

FICURE 2.4 — MATURATION PROCESS OF ENVIRONMENT AUDITING PROGRAMS


Improving overall corporate efficiency
Managing For Results
Organizational learning
Build consensus for environmental programs
Reshape compliance assurance and environmental auditing activities (reduce corporate risks)
Managing Compliance
Diagnostic: redefine compliance assurance activities
Avoiding Problems
Provides remedies for non-compliance
Provides information on compliance

Palmisano, 1983

1 Palmisano, 1983:24.

2.5 REASONS TO CONDUCT ENVIRONMENTAL AUDITING

Environmental auditing programs can serve a number of useful functions within the corporation. Some are a result of the mere exercise of conducting an audit, while others result from the specific information produced and the use to which it is put. Some produce measurable and quantifiable benefits, others do not. Some are "efficiency" motivated; others focus on "effectiveness".

Presented below are some of the more prominent functions that auditing programs fulfill. Note that no single audit program will necessarily address them all. Specific program objectives are an individual decision influenced by, among other things, the needs of upper management, corporate management philosophy, and resource limitations.

Two principal audit functions have already been discussed: to assist facility management and to assure corporate management. Other uses or benefits of corporate environmental auditing programs include:

- o To improve communication between corporate management and operating facilities as well as within both corporate and facility management. Environmental auditing is an excellent means for information sharing and cross-fertilization of ideas.
- o To enhance management's and line personnel's awareness and understanding of environmental concerns, government regulations, company policies, good management practices, operating practices, emergency procedures, and environmental responsibilities. Environmental auditing can be a powerful education and training tool.
- o To provide an early warning of environmental surprises or emergencies. As the saying goes, an ounce of prevention is worth a pound of cure.
- o To identify and assess environmental risks and hazards which could effect company operations or public health, and to determine what actions are necessary to control these risks.
- o To avoid and/or reduce fines and penalties resulting from violations and to protect the corporation and officers from third party liabilities.

- o To identify areas for cost-savings and provide a more efficient allocation of resources (by modifying operating practices and administrative procedures).
- o To document corporate responsibility and "due diligence" in managing environmental activities.
- o To improve emergency response capabilities.
- o To improve corporate image and enhance public relations.

2.6 CONDUCTING AN ENVIRONMENTAL AUDIT

There is no model approach to conducting an environmental audit; an approach well-suited to one firm may not be appropriate to another. Most programs are tailor-made to fit the specific needs, organizational structure, capabilities, resources and management philosophy of the implementing firm. Audit programs therefore vary in their degree of formality, structure and rigour. In this section, the major steps involved in conducting an environmental audit are discussed.[1] They are outlined in Figure 2.6.

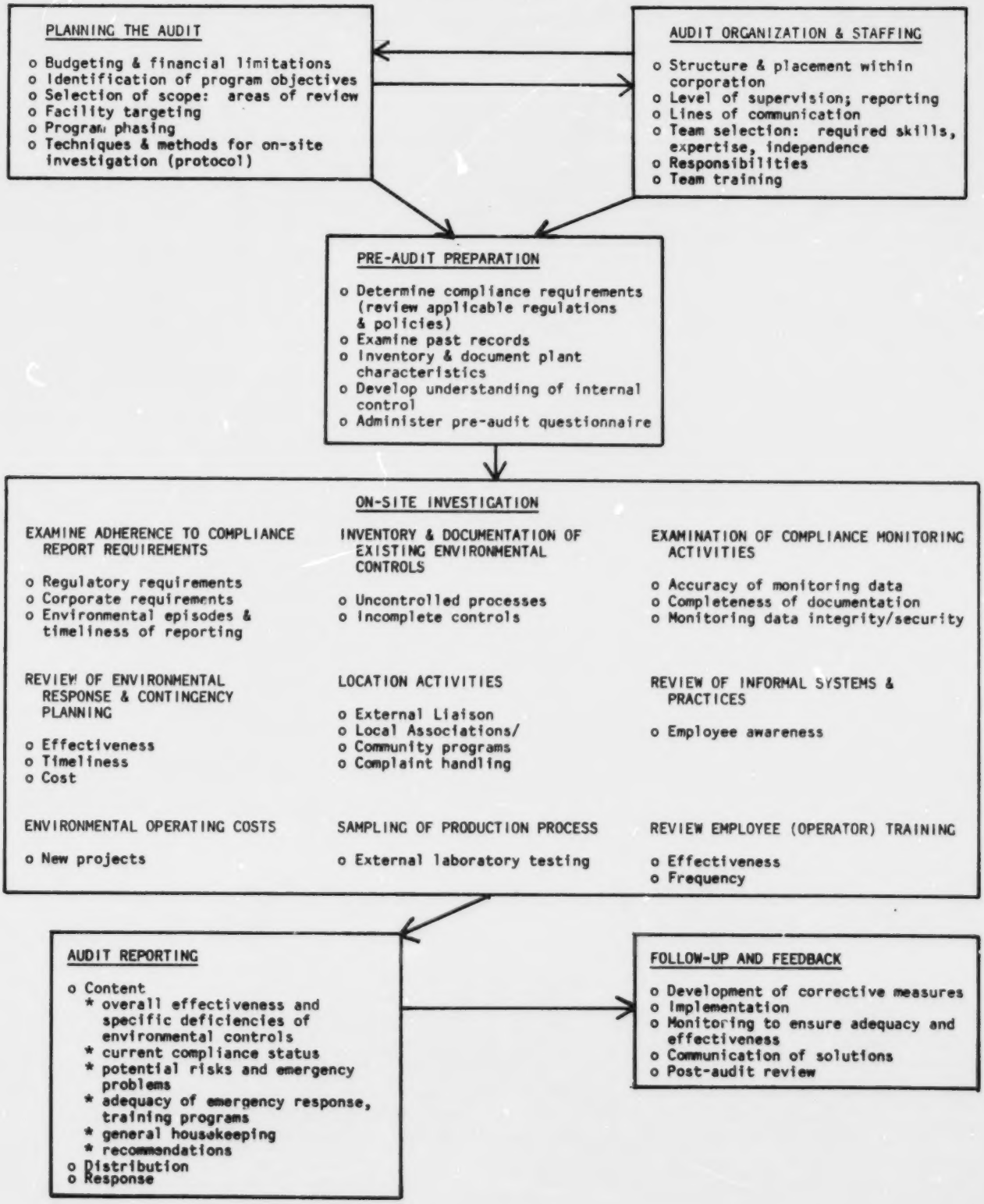
The auditing process is not always as linear as the following discussion might indicate. This is particularly so for the first two steps -- audit organization and staffing, and planning the audit -- where issues and questions regarding budgeting, staffing, organization, objectives, areas of review and so on are addressed in various sequences, often simultaneously.

Many factors will have a bearing on the ultimate success and effectiveness of an audit program. The skills and expertise of the auditors and the financial resources for the program are two obvious examples. There are others. One of the most critical perhaps, is that the audit program have the full support and commitment of top level senior management, preferably transmitted in the form of a policy statement or directive. Such commitment adds legitimacy and weight to the audit program, ensuring that it will be taken seriously by management and operating personnel and that it will command the necessary resources.

---

[1] For a more detailed discussion of the audit process, see: Reed, John W., 1984:30-70.

FIGURE 2.6 — ENVIRONMENTAL AUDIT PROCESS


PLANNING THE AUDIT
o Budgeting & financial limitations
o Identification of program objectives
o Selection of scope: areas of review
o Facility targeting
o Program phasing
o Techniques & methods for on-site investigation (protocol)
AUDIT ORGANIZATION & STAFFING
o Structure & placement within corporation
o Level of supervision; reporting
o Lines of communication
o Team selection: required skills, expertise, independence
o Responsibilities
o Team training
PRE-AUDIT PREPARATION
o Determine compliance requirements (review applicable regulations & policies)
o Examine past records
o Inventory & document plant characteristics
o Develop understanding of internal control
o Administer pre-audit questionnaire
ON-SITE INVESTIGATION
EXAMINE ADHERENCE TO COMPLIANCE REPORT REQUIREMENTS
o Regulatory requirements
o Corporate requirements
o Environmental episodes & timeliness of reporting
INVENTORY & DOCUMENTATION OF EXISTING ENVIRONMENTAL CONTROLS
o Uncontrolled processes
o Incomplete controls
EXAMINATION OF COMPLIANCE MONITORING ACTIVITIES
o Accuracy of monitoring data
o Completeness of documentation
o Monitoring data integrity/security
REVIEW OF ENVIRONMENTAL RESPONSE & CONTINGENCY PLANNING
o Effectiveness
o Timeliness
o Cost
LOCATION ACTIVITIES
o External Liaison
o Local Associations/
o Community programs
o Complaint handling
REVIEW OF INFORMAL SYSTEMS & PRACTICES
o Employee awareness
ENVIRONMENTAL OPERATING COSTS
o New projects
SAMPLING OF PRODUCTION PROCESS
o External laboratory testing
REVIEW EMPLOYEE (OPERATOR) TRAINING
o Effectiveness
o Frequency
AUDIT REPORTING
o Content
* overall effectiveness and specific deficiencies of environmental controls
* current compliance status
* potential risks and emergency problems
* adequacy of emergency response, training programs
* general housekeeping
* recommendations
o Distribution
o Response
FOLLOW-UP AND FEEDBACK
o Development of corrective measures
o Implementation
o Monitoring to ensure adequacy and effectiveness
o Communication of solutions
o Post-audit review

2.6.1 Audit Organization and Staffing

Before the audit exercise can begin, a number of issues must be resolved. These range from the appropriate structure of the audit function and its placement within the organization, to the selection of team members. Such factors have an important bearing on the capability, integrity, credibility and ultimate success of the exercise.

(i) Organizational Issues

The most appropriate organizational design for a particular company's environmental auditing program will depend on the number, type and location of operating plants, on the overall organizational structure of the company, and on the objectives of the audit program. Some of the matters to be established include:

- o The structure and placement within the organization
- o Internal authority
- o The management level of supervision
- o A formal system of controlling and organizing the work
- o Relationships within the program and between it and other organizational components
- o Lines of communication and reporting structure
- o Roles and responsibilities of environmental auditing units and personnel; expectations of other personnel
- o Accountabilities of auditing and management personnel.

(ii) Selecting the Audit Team

Audit team[1] selection can affect objectivity, credibility, cost and scope. The overall quality of the audit program is a direct result of the competence, training, expertise and proficiency of the audit team members. The most important considerations are a) who conducts the audit (in-house (plant, division, corporate) vs. outside (consultant) personnel), and b) the skills and expertise required to conduct the audit.

---

[1] Although reference to an audit "team" will be made throughout this paper, the audit exercise can be conducted by an individual.

(a) Expertise, Skills and Experience

Audit teams can draw from a variety of disciplines and backgrounds, although the precise composition is dependent on several factors -- realistic limitations on available 'human' and financial resources being the most obvious.

The audit team should have:

- o knowledge and expertise of the technical, (pollution control) equipment and the management systems and controls of operating facilities
- o familiarity with the audited facility, including informal controls, local problems and trends
- o the necessary scientific background and expertise to identify potential environmental risks
- o training in auditing techniques and methods; investigative abilities
- o communication and interpersonal skills

(b) Independence

When selecting the audit team, corporate management has three main options: a) use in-house personnel; b) use outside (consultant) personnel; or c) use a combination of the two. Each has its advantages and disadvantages.

The use of in-house personnel is desirable because they are more familiar with company operations. No two audit sites are identical. The particular history, product line, topography, location, worker relations, work flow, manufacturing process, community relations, financial considerations and worker/management traditions of any one site may call for nuances of approach to the audit.[1]

Internalizing the audit program institutionalizes the process, thereby ensuring that an awareness of the environmental audit is prevalent throughout the corporation. As a long-term activity, the development of

---

[1] Truitt, et al, 1981:10.

internal expertise and the building of a permanent in-house team is likely the most cost-effective choice. Internalizing the audit also provides more flexibility for procedural and substantive change throughout the audit program. Moreover, it may improve or even open communication channels within and between corporate divisions and departments, because of the many departments that may be consulted during the process.

The most obvious advantages in using outside personnel are degrees of independence, objectivity, and credibility accorded to the audit program and final report. As a rule, outside auditors are detached from the operations as a whole, enabling them to take a larger and more objective perspective of the company's operations. Often, an outside audit team will have more resources to draw upon and will thus bring a level and depth of expertise and experience not found with in-house personnel.

There is a third option, and for some companies, it may be the best: a combination of in-house and outside personnel. This might consist of using an experienced outside consultant to design and establish the audit program and to train the in-house personnel, who then conduct the audits. This option would appear to resolve the conflict between, on the one hand, wanting to internalize the audit process and build in-house expertise and, on the other, not having the personnel with the required skill, knowledge and experience.

2.6.2 Planning the Audit

Planning and designing the environmental audit program demands the consideration and resolution of a number of policy and design issues. Planning the audit is a dynamic and iterative process; it will both determine and be determined by a number of factors.

(i) Budgeting

Budgetary limitations will influence the scope and depth of the audit (areas of review), staffing (the degree to which internal or external personnel are used), the time commitment of the exercise, and the number of facilities that can be audited in a given period of time.

(ii) Identification of Program Objectives

The objectives of the audit program are pivotal. They have a profound influence on every facet of the program, including its cost, design, scope, staffing, procedures and overall success. Program objectives must be established early in the process, presumably by upper management, corporate environmental affairs and core audit team members. They should be designed with the needs and expectations of the Board of Directors, Chief Executive Officer and other corporate officers in mind and be consistent with other corporate objectives and policies, the corporation's culture and its overall environmental management philosophy.

Table 2.6.2A presents a list of potential objectives for an environmental audit program. While they are not inherently mutually exclusive, given the realistic constraints faced by a company and company's differing information needs, it is highly unlikely that a single environmental audit program would address all objectives.

(iii) Facility Targeting

For corporations that have more than one operating facility, or for corporations with more than one division or operating company, it is necessary to determine which facilities, divisions or operating companies are covered by the audit program? Does the program apply to all company facilities, or just selected ones? More important, how are facilities selected -- what are the criteria for choosing one facility over another? Even if a firm will eventually audit all facilities, phasing in the program still requires that a selection decision criteria be established.

Such criteria could include the quality of existing information at each plant, information obtained from previous audits, degree of past scrutiny by corporate headquarters, facility compliance status reports, number of past enforcement actions or non-compliance problems, age and size of plants, location (proximity to public areas), known problems,

TABLE 2.6.2A — POTENTIAL OBJECTIVES FOR ENVIRONMENTAL AUDITING PROGRAMS

- o Determine and verify compliance with appropriate federal, provincial and local laws and regulations, and corporate policies.
- o Provide assurance to management that systems for managing environmental affairs are operating effectively.
- o Improve the overall level of environmental awareness among officers and employees.
- o Determine the current cost of compliance with environmental requirements.
- o Determine future expenditures for environmental compliance and identify potential cost savings.
- o Identify and detect unforeseen environmental risks and hazards (early warnings).
- o Improve communication between corporate management and operating facilities.
- o Enable comparison between operating facilities and identify shared problems/solutions.
- o Assist facility management in identifying and correcting compliance problems.
- o Assure adequate, up-to-date environmental data base for internal management awareness, decision-making and regulatory requirements.
- o Provide definite material for positive public relations and show due diligence.
- o Evaluate existing employee training programs and provide a comprehensive data base which can aid in training personnel.
- o Develop an information base to be used in emergency situations and crisis management.
- o Assess and increase the effectiveness of emergency response activities.
- o Improve the overall environmental performance of operating facilities by reducing and containing environmental problems.
- o Accelerate the overall development of environmental management and control systems.
- o Avoid corporate liabilities and enforcement proceedings, and to minimize fines.

[1,2,3]

---

1 Truitt, et al 1981:8-23

2 Perma, 1983:17

3 A. D. Little, 1980:4

perceived risk, types of processes conducted, expenditures on pollution control equipment, resource availability, outside complaints, etc.[1,2]

Environmental audit target criteria are often vaguely defined and informally applied. Facility selection is often based on subjective and arbitrary considerations -- especially when the first facility is selected -- such as the anticipated and desired results of the audit. As the audit program develops and matures, consistency in selection must be applied through a given set of decision criteria.

(iv) Areas of Review

The scope of individual audits, that is, the particular areas of review, defines the boundaries of the program and should be established early in the process. Areas of review will be determined by the objectives of the program, and could include any of those activities identified in Table 2.6.2B.

While concerns over industrial hygiene, occupational health, and ccupational safety do not appear in Table 2.6.2B, they have been addressed by the environmental auditing programs of several firms, particularly by those companies with a "Health, Safety and Environmental" type of department.

(v) Scheduling

While some firms may conduct a one-time environmental audit, most firms will elect to conduct their audits on an on-going basis with a planned regular cycle. The need for top management to be aware of compliance status, environmental performance and management effectiveness is a continuing one and is best satisfied through the periodic auditing of operating facilities.

---

1 Palmisano, 1983:25

2 Guida, 1982:570

TABLE 2.6.2B — ENVIRONMENTAL AUDIT SUBJECTS OF REVIEW

Regulatory

- o Permits and regulatory requirements (air, water, land, noise, transportation)
- o Monitoring and recordkeeping procedures
- o Reporting and notification (external) procedures
- o Waste generation, storage, transportation, disposal
- o Hazardous substances
- o Contingency planning; emergency response
- o Third party liabilities and lawsuits

Company — Administrative

- o Communication of corporate and plant-level policy
- o Internal organization: environmental authority and responsibility
- o Internal notification and reporting
- o External communications, local associations
- o Training programs
- o Filing systems
- o Informal systems and internal controls
- o Complaint handling, sources and response
- o Environmental operating and capital costs
- o Employee awareness

Company — Technical

- o Facility inputs (raw materials) and outputs (products)
- o On-site/off-site facilities
- o Operating practices (start up, shut down)
- o Pollution control facilities and equipment
- o Laboratory equipment, protocols, procedures
- o Routine maintenance and repairs
- o Inspection and calibration of monitoring and pollution control equipment
- o Environmental incidents and follow up activities
- o Loss prevention

A firm must set a time interval between audits that is both meaningful and financially reasonable. It should be such that sufficient time is allowed to design, implement and monitor corrective actions, but not so much time that new problems can arise and develop to unmanageable proportions. A period of one to three years would seem reasonable.

Some companies have elected to phase in the audit program -- beginning slowly and expanding over time. These programs began by auditing only certain facilities, or certain regulations or environmental media at those facilities. Over time, they were expanded to audit all facilities in a multi-media fashion.[1] The appropriateness of a deliberate incremental strategy for any one company must be decided on a case-by-case basis.

2.6.3 Pre-Audit Preparation

Considerable preparation must be carried out before the on-site audit occurs. Evaluation, assessment and verification activities require an intimate familiarity with what is being evaluated, assessed and verified. Equally important is a familiarity with the "ideal" condition against which performance is measured or judged.

(i) Compliance Requirements

Audit team members must be familiar with the regulatory framework within which the company operates, the specific laws and regulations that are applicable to the company's operations and the requirements of those regulations. This regulatory preparation may require input from a lawyer, depending on the expertise of the team members.

---

[1] Penna, Richard. 1983:20.

(ii) Facility Characteristics

The audit team must be familiar with the technical and physical operations of the audited facility including the chemicals and substances imported, stored, processed, emitted or disposed of (regulated substances) and the specific on- and off-site facilities such as operating units, smokestacks, incinerators, pipes, discharge points, and waste treatment systems. A blending of these two information pools -- characteristics of the plant and relevant environmental compliance requirements -- helps to establish, at least on a preliminary basis, the basic elements of analysis in the environmental audit.

(iii) Internal Control Systems

In the environmental context, internal control refers to the informal and formal means that an organization institutes to direct, control and check upon its environmental activities. It consists of a variety of checks and balances designed to detect and prevent discrepancies between external legal requirements and internal policies, procedures and objectives. Included are management or administrative controls ('software') as well as mechanical or technical controls ('hardware').

(vi) Pre-Audit Questionnaire

Pre-audit questionnaires can be a valuable feature of the overall environmental auditing program, although the precise role and importance attached to such questionnaires varies from firm to firm.

For example, they can

- o be an important tool in the audit team's preparation for the audit and familiarization with the targeted facility, providing important information about the physical layout and characteristics of the plant, on-site and off-site facilities, permits and regulatory requirements, plant history, repetitive problems, regional setting and so on.
- o help to develop an understanding of the internal controls of the facility - organizational structure, monitoring/

reporting/notification procedures, environmental responsibilities, authority.

- o provide a preliminary indication of the adequacy, effectiveness and efficiency of the environmental compliance assurance system, identify deficiencies in the system and further information needs.
- o serve as an important tool to guide and streamline the on-site investigation, identifying problem areas in need of detailed analysis, verification needs (inspection, observation and testing), and appropriate personnel to interview -- all of which ensures that on-site time and effort is spent more efficiently and effectively.
- o provide plant and line management with a comprehensive single document record of environmental controls which can serve as a handy reference tool.

Pre-audit questionnaires should be completed by site personnel with direct responsibility for environmental affairs prior to the on-site visit. The interval between questionnaire administration and on-site investigation will vary from firm to firm, and can be anywhere up to a full year. Generally, enough time should be allowed for audit team members to make fullest advantage of the information.

(vii) Pre-Visitation Meeting

During the design and "selling" stages of the environmental audit program, it may be necessary that a meeting be held with the targeted facility's managers well in advance of the on-site investigation. There may be resistance to the audit program at the plant level, from both the managers and employees (perhaps even their labour unions). This meeting is used to introduce and clarify the program to the plant's managers, familiarizing them with its purpose, benefits and procedures. It is also used to establish liaison, to select potential audit teams members, and to identify on a preliminary basis which plant personnel will participate. Input from the targeted facility's managers can be used in the design of the audit program.

2.6.4 On-Site Investigation

On-site investigation, or "field work", is the heart of the environmental audit process. Field work is an umbrella term which describes the activities and efforts of the audit team to collect and document data and information. There are a variety of tools and techniques used in the field investigation. These include: questionnaires, checklists, interviews, physical inspection, observation, sampling and testing. Each yields different types of information and so most firms employ a combination. The on-site investigation itself normally consists of the pre-audit meeting, the audit, and the exit interview.

(i) Formal Notification

Targeted facilities should be formally notified prior to the on-site activities. Plant management that feels it is being assisted and not inspected by corporate management is much more likely to be cooperative and open, volunteering and identifying information which is seen to be in its own best interest to know.

The length of time between formal notification and on-site investigation varies from firm to firm, ranging anywhere from several days to several months.

(ii) Pre-Audit Meeting

The first step of the on-site investigation is the pre-audit meeting between the audit team and appropriate personnel from the operating facility. At this meeting, the audit program and detailed schedule is reviewed, outlining what areas and facilities are to be audited, the types of information sought, and the ways such information is to be collected. Any special problems or concerns are discussed and questions from facility personnel are fielded. Facility personnel may suggest the most appropriate operating personnel to interview and the most efficient and effective ways to collect the desired information. The pre-audit meeting also provides the opportunity for team members and facility personnel to become familiar with one another, which may help to foster communication and cooperation.

(iii) Audit

A major purpose of the on-site visit is to verify findings and information previously provided by the plant records, reports, personnel, pre-audit questionnaire, and other sources. As such, it will verify the existence and operation of compliance assurance activities in conformance with appropriate procedures, the accuracy of submitted reports, and the adherence to specified reporting requirements. Particular attention should be paid to ambiguities or deficiencies identified by other pre-audit information sources. A second major purpose of the on-site visit is to gather new information: to identify and document any audit elements or deficiencies not covered by pre-audit information sources.

The on-site audit consists of three general activities: inquiry, observation, and testing. Each yields different and valuable information. The cost and time of conducting an audit increases with the amount of observation, and especially testing, employed.

(a) Inquiry

Inquiry refers to both formal and informal interviews and discussions held with operating and management personnel. Such interviews should be conducted with a representative sample of plant personnel. Line operators, technicians, laboratory scientists, maintenance personnel, and management personnel are valuable sources of information.

Interviews are also valuable in identifying informal systems. Informal systems can have a profound influence -- positive and negative -- on the effectiveness and efficiency of the overall industrial or management system. Because they are not recorded in operating manuals or management policies they can usually only be identified through casual discussions and observation.

(b) Inspection/Observation

Site inspection and visual observation are crucial elements of the on-site audit. They too can make use of aids such as checklists, surveys,

plot plans, cameras, and so on. The specific areas of review will depend on the scope of the audit and the characteristics of the audited facility. In general, it will cover day-to-day activities, monitoring procedures, operating units, off-site facilities, filing systems, past records, training methods, recordkeeping, physical layout, general housekeeping, discharge points and other areas as the audit team sees fit.

(c) Testing

The third general activity employed in the on-site audit is 'testing'. Testing takes two forms. First, it refers to the external sampling and laboratory analysis of emitted substances, effluents, and discharges in order to verify the accuracy of submitted reports and of sampling and testing devices and protocols. Many firms don't do any external laboratory testing at all. Second, it also refers to tests of management systems and procedures, for example, a paper trail test. Are proper reports being submitted to appropriate personnel in a timely manner? Are appropriate personnel notified about excursions beyond standards or about emergencies? Do employees know what to do in the event of an emergency?

(iv) Exit Interview

At the conclusion of the on-site audit, an 'exit interview' is held with the plant manager and environmental staff. This meeting gives management preliminary feedback on the plant's performance and on the effectiveness of existing management and technical control systems. If necessary, such information can be acted upon immediately. It also gives the plant managers an opportunity to comment on and help interpret the audit findings, to ensure their completeness and accuracy and to clarify any misunderstandings or ambiguities.

2.6.5 Audit Reporting

Specific reporting procedures and requirements are key components in conducting an environmental audit. Audit results must be presented in a clear, meaningful and consistent fashion and they must be

received by appropriate levels of management in a timely manner. Audit reports vary considerably in their purpose, preparation, format, content, distribution and response, although the generic process of reporting audit findings is relatively consistent from program to program.

(i) Report Purposes

The prime purpose of the report is to communicate findings. While this information must be linked with the audit program's goals and objectives, it must also address the different information needs and functions of various levels of management throughout the corporate hierarchy. The report also initiates corrective action. It identifies and communicates deficiencies to those personnel with the authority to initiate or direct corrective actions. Finally, as a written account, the audit report provides documentary evidence of: 1) the environmental condition and compliance status of the facility, 2) having done an environmental audit, and 3) "due diligence" in self-monitoring, identifying and responding to identified deficiencies.[1] The audit report becomes a handy reference tool that can be used repeatedly by management. It is also valuable as a starting point for subsequent audits of the facility.

(ii) Report Preparation

There is strong consistency among private environmental auditing programs as to the process conducted in preparing audit reports. The key steps can be summarized as follows:

1. The audit team prepares a draft report of audit findings based on preparatory and on-site activities.
2. The draft report is circulated for review and comment to ensure continuity, accuracy and adequacy. Reviewers generally include audit team members, individuals directly involved in the audit (plant manager and environmental staff) and legal counsel (if not already directly involved), but generally not upper management.

---

[1] A. D. Little, 1983.

3. Relevant comments and suggestions are incorporated and final report is prepared and distributed to appropriate constituencies, which include upper managers.
4. Action plans are reviewed by the audit team and, where necessary, other appropriate personnel.
5. Follow up on action plans, in the form of 'progress reports' are often prepared until all identified deficiencies have been addressed.[1,2]

(iii) Report Content

The ultimate value of the report, and hence the audit program, depends on what kind of information is communicated to whom. Information must be presented in a clear, concise, understandable and usable fashion. The final result should be an "account" of the environmental assets and liabilities of the operating facility. It should identify and describe those areas in which the firm is in compliance and in which existing practices are adequate, as well as those areas of non-compliance or in which existing practices are inadequate. Findings are often divided into categories such as "minor" vs. "major", "significant" vs. "critical", "corrective" vs. "non-corrective", or "regulatory" vs. "non-regulatory". The specific subject matter addressed by the report could include:

- o the purpose, objectives, scope, conduct and participants of the environmental audit.
- o a brief history of the plant; comments and follow-up on previous audit.
- o compliance with environmental regulations (all media audited) including requirements, findings, excursions and recommended actions.
- o suitability of training programs.
- o preparedness for environmental emergency episodes.
- o overall environmental management and control system, including effectiveness, efficiency and adequacy, recommended changes to facilities and systems, and potential for cost savings.

---

1 Basta, 1983:10-11

2 A. D. Little, 1982:2

- o general environmental housekeeping and observations indicating good practices as well as items of concern.

(iv) Report Format

There is no standard format for presenting audit findings. It will vary from firm to firm, depending on the scope of the audit, other reporting practices, and the writing style of the preparer. Whatever format is adopted, subsequent audit reports should be written in a consistent fashion.

(v) Report Distribution

The distribution of the final audit report depends on the company's sensitivity to confidentiality and must be treated in a manner similar to comparable documents. Invariably, the plant manager receives a copy, and at his discretion it may be distributed to other appropriate line managers. Most companies also submit the audit report to top level management, including President, Chief Executive Officer, or Vice-President(s). Other recipients of the report may include the legal department, regional managers, environmental staff (at the corporate and plant level), plant level engineering and manufacturing staff, and audit team members.

2.6.6 Follow-up and Feedback

Follow-up and feedback procedures are the cornerstone of effective environmental auditing. They have already been stressed in Section 2.3.6 and need no further discussion here. Briefly, report preparation and distribution is not the final step in the environmental auditing process. There must be mechanisms for the post-audit design, review, implementation and evaluation of corrective measures for identified deficiencies.

(i) Post-Audit Assessment

The post-audit assessment is used to assess and "size up" the overall effectiveness of the audit program -- to audit the audit, so to speak. To enhance objectivity, it should be conducted by personnel detached from the design and conduct of the program, or at the very least, should include the opinions of a variety of involved personnel. The evaluation should occur after enough time has elapsed that the effects of the program are observable.

In evaluating the audit, several questions might be addressed, including:

- o Did the audit meet its intended purpose? Were objectives realistic, achievable, clearly defined and understood by all parties?
- o Did goals match management's needs and corporate values and support the environmental management approach?
- o Did the audit team receive necessary cooperation from on-site personnel?
- o Was the audit team properly staffed and meet the needs for reliability, credibility, continuity, and objectivity?
- o Were audit team members adequately trained and experienced?
- o Were there any procedures or practices that require modification? Which ones did not help to achieve stated goals?
- o Were instructions and procedures explicity and was enough evidence/proof gathered to substantiate findings?
- o Were information gathering mechanisms appropriate and useful?
- o Were specific formal reporting relationships between the audit program and various levels of management established?
- o Are audit reports timely and concise and do they clearly and appropriately disclose audit findings?[1,2]

---

[1] Truitt, et al, 1981:120-123

[2] A. D. Little, 1983

2.7 SUMMARY

The preceding pages have attempted to provide the reader with an overview of environmental auditing. Discussion went beyond a simple description of the concept, by including the steps and issues involved in designing and implementing audit programs. Though not intended to be a cookbook, it should serve to stimulate potential auditors and provide a basic framework. Unavoidably, and reluctantly, the foregoing pages left many auditing-related issues unaddressed. These include, among others, certain issues related to the design of audit systems, the potential government responses to private auditing, and the confidentiality of audit reports.

Much of the foregoing discussion was based on the experiences of firms in the United States. The chapters that follow are intended to build an information base which is founded on the Canadian experience with environmental auditing.

PART TWO

Environmental Auditing in the Canadian Private Sector

3.0 COLLECTION OF DATA

The chapters that follow will present the findings of a nation-wide survey of Canadian industries regarding their use of and attitude towards environmental auditing. Specific topics include the level of awareness of environmental auditing, the level of existing use, the characteristics of existing and planned programs, and some general attitudes of industry towards this practice. This chapter in particular addresses the study method.

This investigation was conducted over a period of approximately eleven months, beginning in January, 1984. The principal method of collecting information was the administration of a mailout survey questionnaire to numerous private and public sector organizations across Canada. In addition to this, a large number of personal and telephone interviews were held with industry, trade association, government and academic representatives. A complete activities time-table is given in Figure 3.0.

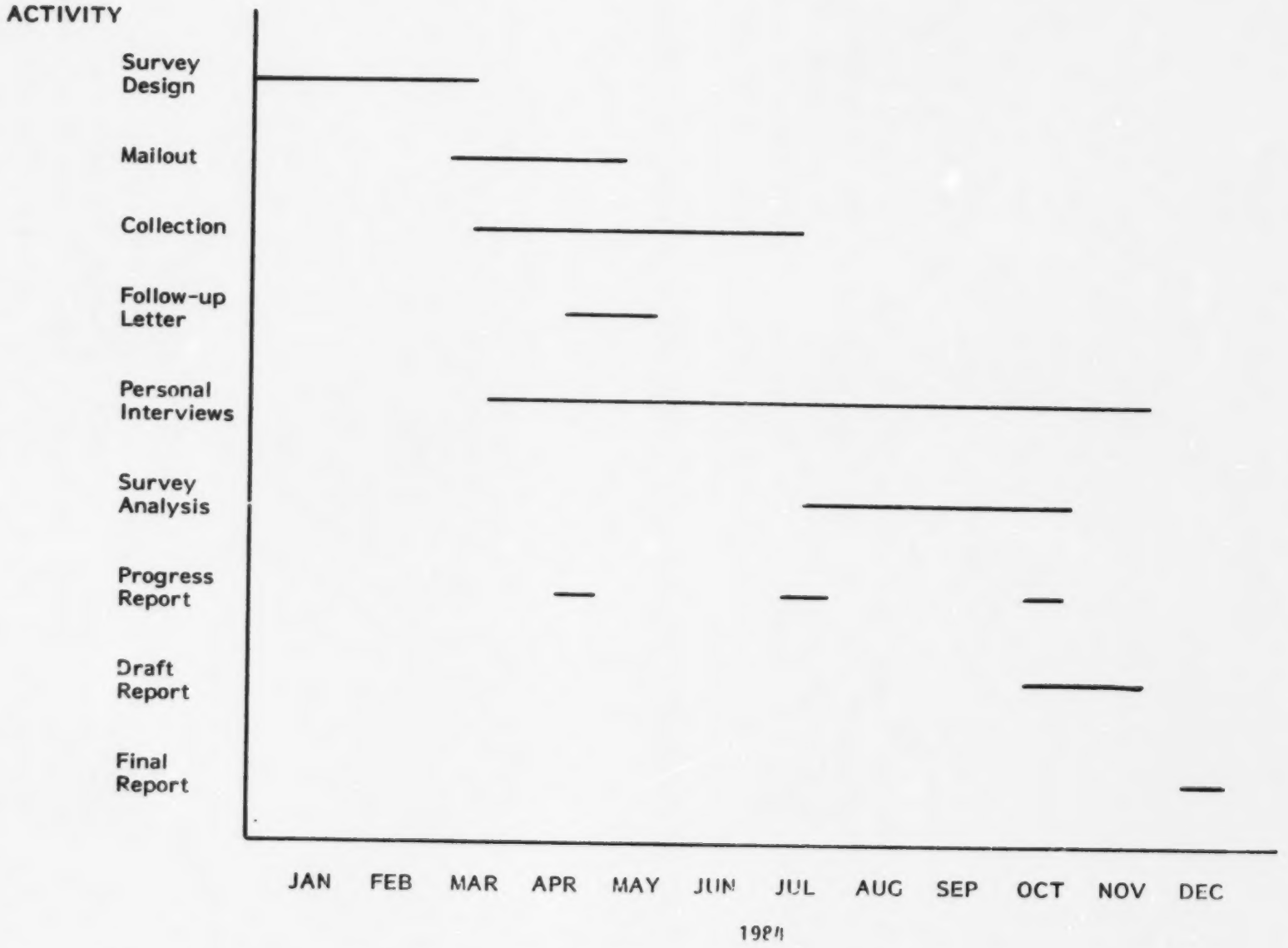
3.1 SURVEY QUESTIONNAIRE

The survey questionnaire was mailed to 116 companies in Canada (119 questionnaires) representing the industrial sectors listed below:

Chemical Manufacturing
Petroleum
Pulp and Paper
Mining
Steelmaking
Food and Beverage
Technology and Equipment
Automotive
Aggregates
Tire Manufacturers
Electric Utilities

These industrial sectors were chosen in order to obtain a good cross-section of Canadian industry (but not necessarily a statistically representative one). The specific companies contacted are listed in Appendix I. Though the choice of individual companies was somewhat arbitrary, the intent was to poll the major corporations from each group.

FIGURE 3.0 — ACTIVITIES TIMETABLE (PHASE II)



The objectives of the questionnaire were to determine:

- o The level of awareness of environmental auditing within the Canadian private sector,
- o The level of existing and planned use of environmental auditing,
- o The characteristics of existing programs,
- o Canadian industry's general attitude toward environmental auditing, including toward potential government initiatives.

(I) Survey Design

Survey design was based on the Total Design Method, an approach to designing and conducting mailout surveys advocated by Don Dillman of Washington State University.[1] The Total Design Method is intended to maximize survey response. Among the features of the Total Design Method adopted in this study were:

- o Minimum use of open ended questions. Most survey questions asked the respondent to select an answer from a list of options. An opportunity for additional comment was often provided. (For example, "Please describe others not listed...".).
- o Use of directional arrows and "GO TO" statements to aid in flow and ease of answering.
- o Twelve page maximum length.
- o Booklet format with 30% reduction of original.
- o Use of personalized, original cover letter. Also suggested content of cover letter.
- o Guaranteed confidentiality of responses.
- o Offer of a tangible reward, such as copy of final report.
- o Inclusion of self-addressed stamped envelope for return of questionnaire.
- o Use of personalized follow-up letter.

---

[1] Dillman, Don. 1982.

(ii) Survey Structure

The survey had several objectives: different types of information were sought from various categories of respondents. This was reflected in the structure of the questionnaire in that different "paths" were created depending on how respondents completed key questions. Figure 3.1 gives a flow diagram of the survey structure.

As this figure illustrates, all respondents were asked Question 1:

"Have you heard of environmental auditing before?"

Those answering "no" were directed to Question 5 and on to Questions 54 - 60. It was assumed that those who had never heard of environmental auditing were unlikely to have or be planning to have an environmental auditing program. Questions 54 - 60 were designed to determine industry's attitude towards environmental auditing, including towards potential government initiatives. Those answering "yes" were asked Question 2:

"Does your company currently conduct an environmental auditing program or similar procedures?"

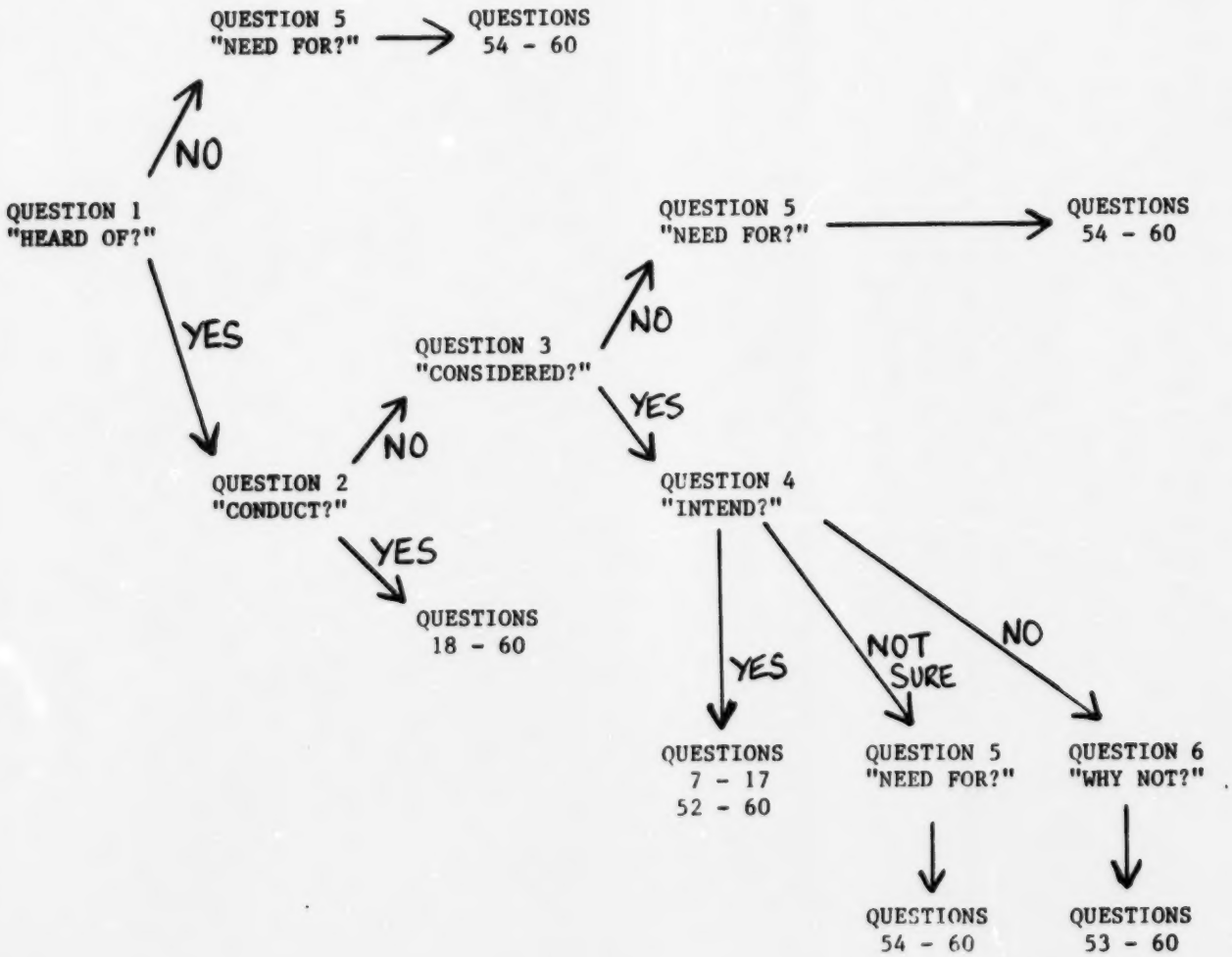
Those answering Question 2 in the affirmative were directed to answer Questions 18 - 60. These questions were designed to document the characteristics of existing programs including the title, objectives, scope, staffing, techniques, reporting and follow-up. Those not currently conducting a program were then asked two questions regarding their intent to conduct an environmental audit program. Since it was unlikely that a firm who hadn't assessed the need for or considered implementing an environmental audit program would in fact develop one, respondents were first asked Question 3.

"Has your company considered implementing an environmental auditing program?"

Those who had not, were directed to answer Question 5 and on to Questions 54 - 60. Those who answered Question 3 in the affirmative, were then asked Question 4.

"Does your company intend to institute an environmental auditing program?"

FIGURE 3.1 — FLOW DIAGRAM OF SURVEY STRUCTURE



Those who answered "no", were directed to answer Question 6 and then on to Questions 53 - 60. Those who were not sure, were directed to Question 5 and on to Questions 54 - 60. Those who did intend to implement a program were directed to answer Questions 7 - 17 and then Questions 52 - 60. Questions 7 - 17 were designed to document the characteristics of planned environmental audit programs.

The survey questionnaire appears as Appendix 2.

(iii) Mailout Package

All survey questionnaires were distributed by March 12, 1984. Included as part of the mailout package were:

- o A personalized, original covering letter (Appendix 3)
- o A one-page description of environmental auditing (Appendix 4)
- o An abstract of the Phase I Final Report, titled "Environmental Auditing: A Review of Current Practice" (Appendix 5)
- o A self-addressed, stamped return envelope.

On April 19, 1984 a follow-up letter was sent to those companies who had not yet returned the questionnaire, asking them to do so. (Appendix 6)

(iv) Survey Response

In total, 119 questionnaires were distributed to 116 companies representing eleven major industrial sectors. (Four questionnaires were sent to one major electric utility.) As Table 3.1 illustrates, 77 completed questionnaires were returned, producing a total completed response rate of 65%. In addition to this, eight responses expressing a desire to decline from participation were received, producing a total gross response rate of 71%. Response rates for individual sectors varied considerably.

TABLE 3.1 SURVEY RESPONSE

Sector	Number of Questionnaires Sent	Gross Response	Completed Response
Chemical	26	18 (69%)	15 (58%)
Petroleum	10	8 (80%)	8 (80%)
Pulp & Paper	19	13 (68%)	12 (63%)
Mining	12	10 (83%)	10 (83%)
Steelmaking	3	2 (67%)	2 (67%)
Utilities	10	9 (90%)	9 (90%)
Technology/Equipment	10	7 (70%)	5 (50%)
Food/Beverage	18	10 (55%)	8 (44%)
Aggregate	5	3 (60%)	3 (60%)
Automotive	3	2 (67%)	2 (67%)
Tire Manufacturing	3	3 (100%)	3 (100%)
TOTAL	119	85 (71%)	77 (65%)

3.2 PERSONAL INTERVIEWS

A second major source of information in this study was personal and telephone interviews. During the time period indicated on Figure 3.0, 65 such interviews were held. Many of these were with industry representatives and were conducted as a follow-up to the completed questionnaire. Others were with representatives from government agencies, the legal profession, consultants, trade associations, and academics. My guarantee of anonymity prevents the disclosure of interviewees names.

Many of these interviews were conducted in the Toronto-centred region. Other areas visited included Vancouver, Edmonton, Calgary, Kingston, Hamilton, Ottawa, Montreal, Washington D.C. and Boston, Massachusetts.

3.3 SUMMARY

While the survey questionnaire provided a mechanical means of gathering information, it was, by its nature, restrictive. The "fit" between my questions and a company's program was not always exact. For

this reason, personal interviews proved to be an invaluable source of information, not just to fill in the gaps and augment the completed questionnaire, but also to provide insight into how the program works within the company.

The next three chapters present the findings of this investigation.

4.0 SURVEY ANALYSIS

The following chapter presents the survey findings with respect to three major objectives of the questionnaire. The first two objectives were to determine the level of awareness of environmental auditing and the levels of current and planned use respectively. The third objective of this study was to determine some of Canadian industry's general attitudes toward environmental auditing. In the questionnaire, respondents were asked their thoughts regarding:

- o The need for environmental auditing (Questions 5 and 53)
- o Whether other companies could benefit by the use of environmental auditing (Question 52)
- o Whether other companies should be encouraged to establish environmental auditing programs (Question 54)
- o Whether the number of firms with environmental auditing programs will increase in the near future (Question 55)
- o The desirability of various potential public sector (government) initiatives.

4.1 LEVEL OF AWARENESS

Table 4.1 illustrates that 91% of the respondents reported having heard of environmental auditing before. However, it was clear from subsequent analysis of question responses and from personal interviews, that a large number of those respondents were referring to something other than what is described as environmental auditing in this study. Consequently, the 91% figure is artificially high.

TABLE 4.1 LEVEL OF AWARENESS

Question 1: "Have you heard of environmental auditing before?"

Sector	No	Yes
Chemical	1 (7%)	14 (93%)
Petroleum	-	8 (100%)
Pulp & Paper	1 (9%)	11 (91%)
Mining	2 (20%)	8 (80%)
Steelmaking	-	2 (100%)
Utilities	-	9 (100%)
Technology/Equipment	-	5 (100%)
Food/Beverage	3 (37%)	5 (63%)
Aggregate	-	3 (100%)
Automotive	-	2 (100%)
Tire Manufacturing	-	3 (100%)
TOTAL	7 (9%)	70 (91%)

4.2 LEVEL OF CURRENT AND PLANNED USE

4.2.1 Current Use

Table 4.2.1 presents the survey findings regarding the current use of environmental auditing.

TABLE 4.2.1 LEVEL OF CURRENT USE

Question 2: "Does your company currently conduct an environmental auditing program?"

Sector	No	Yes	Bona Fide*
Chemical	5 (33%)	9 (67%)	7 (50%)
Petroleum	5 (63%)	3 (37%)	3 (37%)
Pulp & Paper	6 (50%)	6 (50%)	2 (13%)
Mining	5 (50%)	5 (50%)	2 (20%)
Steelmaking	2 (100%)	-	-
Utilities	1 (11%)	8 (89%)	1 (11%)
Technology/Equipt.	1 (20%)	4 (80%)	1 (20%)
Food/Beverage	5 (63%)	3 (37%)	1 (12%)
Aggregate	1 (33%)	2 (67%)	-
Automotive	-	2 (100%)	2 (100%)
Tire Manufacturing	1 (33%)	2 (67%)	1 (33%)
TOTAL	32 (42%)	45 (58%)	20 (26%)

* Based on author's analysis and interpretation of completed questionnaires.

As Table 4.2.1 reveals, a total of 58% of respondents reported that they currently conduct an environmental audit program. However, further analysis and interpretation of Questions 18 - 60, and follow-up in personal interviews, revealed that several of those who claimed to conduct environmental auditing in fact do not.[1] To distinguish between genuine environmental auditing programs and the reported "auditing" activities, Table 4.2.1 contains a column titled "Bona Fide". From this, it can be seen that only 20 of those 45 reported environmental auditing programs were deemed to be genuine. While there are no formal, rigid criteria on which this decision was based, there were several "clues" which indicated that the described programs were something other than what is referred to here as environmental auditing.

Some of these "clues" were:

- o Title: Titles such as "Noise/Dust Monitoring" "Waste Management", "Environmental Programs", "Environmental Control" often signalled programs/ procedures other than environmental auditing. A majority of bona fide programs have either "Environmental Audit" or "Environmental Review" as a title.

- o Year Established: Programs established in "1956", "Late Fifties", "Early Sixties", etc. were often not environmental auditing programs (Question 19). Most bona fide programs (but not all) were established since 1980.

- o Frequency: Audit frequencies identified as "Continuous", "Weekly", "Monthly", or "Depends on Specific Regulations" normally signalled routine monitoring programs (Question 25). By contrast, bona fide programs often had a frequency of once every year, every 2 years, or greater.

- o On-site Visit: If the program had no on-site visit by "outsiders" (i.e.: corporate or divisional personnel or external consultants), this often signalled a routine monitoring program. Most bona fide programs utilized an on-site visit from external (to the audited location) personnel.

---

1 More often than not, they were referring to either on-going, plant-level sampling, monitoring and reporting programs and procedures or to one-time, single purpose "audits".

Other "clues" included the length of the on-site investigation ("Hours" was suspicious), the length of written reports (1 - 2 pages did not qualify), and the addresees of the final report ("government authority" did not quality).

Table 4.2.1 reveals that 100% of respondents in the Automotive industry, 50% of Chemical, 37% of Petroleum, 13% of Pulp and Paper, and 20% of Mining conduct bona fide environmental auditing programs. Taken together, these five sectors account for 80% of all bona fide programs documented in this survey. In Section 4.3, most industry specific references made will be to one of these five sectors.

Note that while 26% of respondents have bona fide environmental auditing programs, this is not necessarily representative of Canadian industry. Those 20 documented program comprise only 17% of the total number of companies surveyed. Since there is a low probability that those who did not respond to the survey actually have an environmental audit program[1], this 17% figure may be more representative than the 26% figure.

4.2.2 Intended Use

Table 4.2.2 presents the survey findings regarding the intended use of environmental auditing. It reveals that almost half (44%) of the respondents who do not have an environmental auditing program have not considered implementing one. Of the ten who have considered implementing a program, six (60%) are now actively planning such a program; four (40%) were "not sure" whether they would actually go ahead. In the Chemical industry all respondents who had investigated environmental auditing decided to adopt it. In the Petroleum industry two of four (50%) decided to go ahead with it, and in Steelmaking, one of two (50%) did.

---

[1] This is an estimate only.

TABLE 4.2.2

INTENTIONS REGARDING THE USE OF ENVIRONMENTAL AUDITING

Sector	Question 3: "Has your company considered implementing an EA program? NO	YES	NOT SURE	Question 4: "Does your company intend to implement an EA program? NO	YES	NOT SURE
Chemical	-	3 (75%)	1 (25%)	-	3 (100%)	-
Petroleum	1 (20%)	4 (80%)	-	-	2 (50%)	2 (50%)
Pulp & Paper	4 (80%)	1 (20%)	-	-	-	1 (100%)
Mining	2 (67%)	1 (33%)	-	-	-	1 (100%)
Steelmaking	1 (50%)	1 (50%)	-	-	1 (100%)	-
Utilities	1 (100%)	-	-	-	-	-
Tech/Equipt.	1 (100%)	-	-	-	-	-
Food/Beverage	2 (100%)	-	-	-	-	-
Aggregate	1 (100%)	-	-	-	-	-
Automotive	-	-	-	-	-	-
Tire Mfg.	1 (100%)	-	-	-	-	-
TOTAL	14 (56%)	10 (40%)	1 (4%)	-	6 (60%)	4 (40%)

These figures produce a better picture of activity in the Canadian private sector. For instance, it can now be said that 67% of the respondents in the Chemical industry either currently conduct or plan to conduct a corporate environmental auditing program. For the Petroleum sector, the figure is 63% and for Steelmaking, 50%. Figures for all other sectors remain as they appear in Table 4.2.1 in the "Bona Fide Programs" column.

4.3 CANADIAN INDUSTRY GENERAL OPINIONS & ATTITUDES

4.3.1 Need for Environmental Auditing

All respondents were asked a question regarding the need for environmental auditing. Those respondents who reported that they currently conducted an environmental auditing program, or intended to implement an environmental auditing program, or had considered, but rejected implementing an environmental auditing program, were directed to answer Question 53.

"Is there a need for environmental auditing?"

The responses to this question are found in Table 4.3.1B. All other respondents were directed to answer Question 5.

"Do you think there is a need for environmental auditing at your company's operating facilities?"

Respondents to Question 5 fell into three categories: those who reported that they had never heard of environmental auditing before (from Question 1), those who did not conduct and had not considered implementing an environmental auditing program (from Question 3), and those who were "not sure" whether they would be implementing an environmental auditing program (from Question 4). The responses to this question are found in Table 4.3.1A.

A total of 21 respondents completed Question 5. Eleven (52%) felt that there is <u>not</u> a need for environmental auditing at their operating facilities. Less than half of that number (24%) felt that there <u>is</u> a need and the other 24% were "not sure". Not surprisingly, six of the seven respondents who had never heard of environmental auditing before felt that there is not a need for it.

TABLE 4.3.1A

THE NEED FOR ENVIRONMENTAL AUDITING

Question 5:
"Do you think there is a need for environmental auditing at your company's operating facilities?"

	GROUP A			GROUP B			GROUP C		
	NO	YES	NOT SURE	NO	YES	NOT SURE	NO	YES	NOT SURE
Chemical	1 (100%)	-	-	-	-	-	-	-	1 (100%)
Petroleum	-	-	-	-	-	1 (100%)	-	1 (50%)	1 (50%)
Pulp & Paper	1 (100%)	-	-	3 (100%)	-	-	-	1 (100%)	-
Mining	2 (100%)	-	-	1 (50%)	-	1 (50%)	-	1 (100%)	-
Steelmaking	-	-	-	-	-	-	-	-	-
Utilities	-	-	-	-	-	-	-	-	-
Technology	-	-	-	-	1 (100%)	-	-	-	-
Food/Beverage	2 (67%)	1 (33%)	-	1 (100%)	-	-	-	-	-
Aggregate	-	-	-	-	-	-	-	-	-
Automotive	-	-	-	-	-	-	-	-	-
Tire Manufacturing	-	-	-	-	-	1 (100%)	-	-	-
TOTAL	6 (86%)	1 (14%)	-	5 (56%)	1 (11%)	3 (33%)	-	3 (60%)	2 (40%)

GROUP A - from Question 1 - never heard of environmental auditing
GROUP B - from Question 3 - hadn't considered
GROUP C - from Question 4 - "not sure" would implement

From those who answered "no" came comments like:

> "Normal stewardship process may handle without special audit".
>
> "Need not yet clearly defined".
>
> "Other mechanisms may be more effective, cost effective and possibly within manpower constraints".

Interestingly, three of the five respondents who were "not sure" whether they would implement an environmental auditing program felt that there was a need for it. One can only speculate as to whether or not these companies would eventually establish an auditing program.

From those who answered "yes" to Question 5, came the following comments.

> "...it would provide a more systematic and comprehensive review than is currently done".
>
> "To ensure that operating and testing procedures are being maintained in accordance with standard procedures".
>
> "To ensure that procedures and equipment are in place to maintain compliance with regulatory requirements, to provide the necessary response to emergency situations, to monitor effects of non-environmental process changes on emissions and risks, and to ensure that potential liabilities to third parties are minimized".
>
> "Would be useful management awareness information in the event of serious problems".
>
> "To ensure that operating divisions are complying with company requirements".

Respondents to Question 53 fell into two categories: Those who currently conduct environmental programs, and those who intend to conduct environmental programs. (Although there was the potential for a third category those who had considered but did not intend to implement an environmental auditing program, no respondent fell into this group; therefore, it does not appear in Table 4.4.1B.) A total of 50 respondents completed Question 53. 96% of those felt that "yes", there is a need for environmental auditing. The other four percent were "not sure". Not one single respondent answered "no" to this question.

TABLE 4.3.1B

NEED FOR ENVIRONMENTAL AUDITING

Question 53:
"Is there a need for environmental auditing?"

	GROUP A			GROUP B			TOTAL		
	NO	YES	NOT SURE	NO	YES	NOT SURE	NO	YES	NOT SURE
Chemical	-	9 (100%)	-	-	2 (67%)	1 (33%)	-	11 (92%)	1 (8%)
Petroleum	-	3 (100%)	-	-	2 (100%)	-	-	5 (100%)	-
Pulp & Paper	-	5 (83%)	1 (17%)	-	-	-	-	5 (83%)	1 (17%)
Mining	-	5 (100%)	-	-	-	-	-	5 (100%)	-
Steelmaking	-	-	-	-	1 (100%)	-	-	1 (100%)	-
Utilities	-	8 (100%)	-	-	-	-	-	8 (100%)	-
Technology	-	4 (100%)	-	-	-	-	-	4 (100%)	-
Food/Beverage	-	3 (100%)	-	-	-	-	-	3 (100%)	-
Aggregate	-	2 (100%)	-	-	-	-	-	2 (100%)	-
Automotive	-	2 (100%)	-	-	-	-	-	2 (100%)	-
Tire Manufacturing	-	2 (100%)	-	-	-	-	-	2 (100%)	-
TOTAL	-	43 (87%)	1 (2%)	-	5 (83%)	1 (17%)	-	48 (96%)	2 (4%)

GROUP A - Those who currently conduct environmental auditing programs
GROUP B - Those who intend to conduct environmental auditing programs

The comparison between the respondents of Question 5 and Question 53 is straightforward and rather self-evident: Those with existing or planned programs feel there is a need for it, while those who do not have programs, see little need for it.

The following general comments by respondents pertain to the need for environmental auditing.

> "Environmental auditing is not useful at the plant level, it is more of a corporate tool".
>
> "Environmental auditing is useful for identifying long term concerns as plants are generally concerned with day-to-day activities".
>
> "Environmental auditing is not a panacea — it is only one of several tools".
>
> "We've been putting out fires until now — environmental auditing might provide a better standardization of operations across the company".
>
> "Environmental compliance auditing is an established and essential "in-house" control function in large corporations with diversified operations. It provides the only positive means on this scale to assure adherence to corporate social responsibility policies and the avoidance of harm to the environment and public health".
>
> "It depends on the company".

4.3.2 Benefits to Other Companies

Those respondents who reported that they currently conduct an environmental auditing program, or intend to conduct an environmental auditing program, were directed to answer Question 52:

> "Do you think other companies would benefit by the use of "environmental auditing" or similar procedures?"

As Table 4.3.2 illustrates of the 48 respondents who completed this question, 63% felt that other firms could benefit from the use of environmental auditing. The remaining 37% answered "probably".

TABLE 4.3.2

BENEFIT TO OTHER COMPANIES

Question 52:
"Do you think other companies could benefit by the use of environmental auditing or similar procedures?"

	GROUP A				GROUP B				TOTAL			
	NO	PROB. NOT	PROB. YES	YES	NO	PROB. NOT	PROB. YES	YES	NO	PROB. NOT	PROB. YES	YES
Chemical	-	-	3 (33%)	6 (67%)	-	-	-	2 (100%)	-	-	3 (27%)	8 (73%)
Petroleum	-	-	-	3 (100%)	-	-	-	2 (100%)	-	-	-	5 (100%)
Pulp & Paper	-	-	4 (67%)	2 (33%)	-	-	-	-	-	-	4 (67%)	2 (33%)
Mining	-	-	1 (20%)	4 (80%)	-	-	-	-	-	-	1 (20%)	4 (80%)
Steelmaking	-	-	1 (100%)	-	-	-	-	-	-	-	1 (100%)	-
Utilities	-	-	3 (43%)	4 (57%)	-	-	-	-	-	-	3 (43%)	4 (57%)
Technology	-	-	2 (50%)	2 (50%)	-	-	-	-	-	-	3 (43%)	4 (57%)
Food/Beverage	-	-	2 (67%)	1 (33%)	-	-	-	-	-	-	2 (67%)	1 (33%)
Aggregate	-	-	1 (50%)	1 (50%)	-	-	-	-	-	-	1 (50%)	1 (50%)
Automotive	-	-	-	2 (100%)	-	-	-	-	-	-	-	2 (100%)
Tire Manufacturing	-	-	1 (50%)	1 (50%)	-	-	-	-	-	-	1 (50%)	1 (50%)
TOTAL	-	-	18 (41%)	26 (59%)	-	-	-	4 (100%)	-	-	18 (37%)	30 (63%)

GROUP A - Those who currently conduct an environmental auditing program
GROUP B - Those who intent to conduct an environmental auditing program

It is interesting to note that those industrial sectors "sold" on auditing (that is, where there is already substantial activity) feel strongly that other companies could benefit. For instance, 73% of the Chemical industry, 100% of the Petroleum industry, and 100% of the Automotive industry respondents answered "yes" to Question 52.

Some of the general comments by respondents included:

"Environmental auditing might have value for companies with several manufacturing plants".

"Only the individual company can know that".

"Maintaining a full-scale auditing capability may not be affordable or necessary in the case of small companies. For them, normal surveillance provided by inspections and the enforcement activities of regulatory agencies will probably suffice to assure protection of the environment and human health".

4.3.3 Other Companies Encouraged

All respondents were directed to answer Question 54:

"Do you think other companies should be encouraged to develop environmental auditing programs?"

Respondents were divided into two categories: Those who currently conduct or plan to conduct environmental auditing programs; and all others (those who do not conduct a plan to conduct an environmental auditing program).

As can be seen from Table 4.3.3, of the 68 respondents who completed Question 54, 81% felt that other companies should be encouraged to develop environmental auditing programs. Only 7% felt that other companies should not be. Not surprisingly, there was considerably more support for encouragement from those respondents who currently conduct or plan to conduct environmental auditing (93%) than from those who do not (59%).

Several interesting general comments were received, including:

"Sounds like Big Brother. Audits are only management tools. Don't tell people how to manage".

TABLE 4.3.3

OTHER COMPANIES ENCOURAGED

Question 54:
"Do you think other companies should be encouraged to develop environmental auditing programs?"

	GROUP A			GROUP B			TOTAL		
	NO	YES	NOT SURE	NO	YES	NOT SURE	NO	YES	NOT SURE
Chemical	-	10 (83%)	2 (17%)	-	1 (50%)	1 (50%)	-	11 (78%)	3 (22%)
Petroleum	-	5 (100%)	-	-	1 (33%)	2 (67%)	-	6 (75%)	2 (25%)
Pulp & Paper	1 (12%)	5 (83%)	-	1 (17%)	4 (67%)	1 (17%)	2 (17%)	9 (75%)	1 (8%)
Mining	-	4 (100%)	-	1 (33%)	2 (67%)	-	1 (14%)	6 (86%)	-
Steelmaking	-	1 (100%)	-	1 (100%)	-	-	1 (50%)	1 (50%)	-
Utilities	-	6 (100%)	-	-	1 (100%)	-	-	7 (100%)	-
Technology	-	3 (100%)	-	-	-	-	-	3 (100%)	-
Food/Beverage	-	3 (100%)	-	1 (20%)	3 (60%)	1 (20%)	1 (13%)	6 (75%)	1 (13%)
Aggregate	-	2 (100%)	-	-	1 (100%)	-	-	3 (100%)	-
Automotive	-	2 (100%)	-	-	-	-	-	2 (100%)	-
Tire Manufacturing	-	1 (50%)	1 (50%)	-	-	-	-	1 (50%)	1 (50%)
TOTAL	1 (2%)	42 (93%)	3 (5%)	4 (18%)	13 (59%)	5 (23%)	5 (7%)	55 (81%)	8 (12%)

GROUP A - Those who currently conduct or intend to conduct environmental auditing programs
GROUP B - All others (do not conduct or plan to conduct environmental auditing programs)

"It is entirely up to each company to decide".

"Why should we [a regulator] need to sell a good management practice?"

4.3.4 Future of Environmental Auditing

All respondents were directed to answer Question 55:

"Do you think the number of firms with auditing programs will increase or decrease in the next 5 years?"

Respondents were again divided into two categories: Those who currently conduct or plan to conduct an environmental auditing program, and all others (those who do not conduct or plan to conduct an environmental auditing program).

Table 4.3.4 reveals, 84% of the 68 respondents who completed this question felt that the number of firms with environmental auditing programs will increase in the next five years. As expected, a greater percentage of respondents from the first category (91%) than from the second (70%) feel there will be an increase. Not one respondent felt that the number of firm's with environmental auditing programs would decrease in the next five years.

Note again that in the Chemical, Petroleum and Automotive industries there is a higher percentage of support (83%, 88% and 100% respectively) than in sectors with less auditing activity, such as, the Pulp and Paper industry (70%).

TABLE 4.3.4

FUTURE OF ENVIRONMENTAL AUDITING

Question 55:
"Do you think the number of firms with auditing programs will increase or decrease in the next 5 years?"

	GROUP A			GROUP B			TOTAL		
	INCREASE	DECREASE	REMAIN THE SAME	INCREASE	DECREASE	REMAIN THE SAME	INCREASE	DECREASE	REMAIN THE SAME
Chemical	8 (80%)	-	2 (20%)	2 (100%)	-	-	10 (83%)	-	2 (17%)
Petroleum	5 (100%)	-	-	2 (67%)	-	1 (33%)	7 (88%)	-	1 (12%)
Pulp & Paper	5 (100%)	-	-	2 (40%)	-	3 (60%)	7 (20%)	-	3 (30%)
Mining	5 (100%)	-	-	2 (50%)	-	2 (50%)	7 (78%)	-	2 (22%)
Steelmaking	1 (100%)	-	-	1 (100%)	-	-	1 (50%)	-	1 (50%)
Utilities	7 (100%)	-	-	1 (100%)	-	-	8 (100%)	-	-
Technology	2 (67%)	-	1 (33%)	-	-	1 (100%)	3 (75%)	-	1 (25%)
Food/Beverage	2 (67%)	-	1 (33%)	4 (80%)	-	1 (20%)	6 (75%)	-	2 (25%)
Aggregate	2 (100%)	-	-	1 (100%)	-	-	3 (100%)	-	-
Automotive	2 (100%)	-	-	-	-	-	2 (100%)	-	-
Tire Manufacturing	2 (100%)	-	-	-	-	-	2 (100%)	-	-
TOTAL	41 (91%)	-	4 (9%)	16 (70%)	-	7 (30%)	57 (84%)	-	11 (16%)

Group A - Those who currently conduct or plan to conduct an environmental auditing program
Group B - All others

4.3.5 Potential Government Initiatives

Because of the interest demonstrated by the United States government, and because of the private sector reaction to its proposals,[1] it was felt that a question regarding the Canadian private sector's opinion of potential Canadian government actions would be interesting. All respondents were directed to complete Question 56. This question asked the respondents to rate each of six potential government roles on a scale from one to five:

> "Using the scale given below, indicate your opinion regarding each of the possible Canadian government initiatives listed below".
>
> 1. Strongly oppose
> 2. Mildly oppose
> 3. Neither oppose nor support
> 4. Mildly support
> 5. Strongly support

Each of the six possible initiatives are analysed separately below. Note that for each one, respondents are divided into two categories: those who currently conduct or plan to conduct environmental auditing programs, and all others (those who do not conduct or plan to conduct environmental auditing programs). Note also that respondents were not given the option of ranking "no role at all".

---

[1] In the United States, regulatory agencies at both the federal and state level have been expressing considerable interest in private sector environmental auditing. The federal Environmental Protection Agency for example, has proposed several programs over the past few years. One would have been similar in structure to external financial auditing: Companies would have been required to conduct environmental audits and submit the results to the appropriate agencies, or, to have a certified 'environmental auditor' confirm that the firm was in compliance with regulations. This proposal was not adopted. A second program forwarded by the E.P.A. would have encouraged firms to establish auditing programs by offering them various rewards and incentives such as reduced fines, faster permit renewals, or reduced reporting requirements. This initiative was not adopted either. Currently, the U.S. Environmental Protection Agency has assumed as passive role consisting of analysis, assistance and endorsement. For now, they are letting private sector auditing run its own course.

(i) Fund Research

The responses for Initiative A are given in Table 4.3.5A.

"Initiative A: Fund research projects aimed at promoting the environmental auditing state-of-the-art".

Of the 74 respondents who completed this section of Question 56, 46% either mildly or strongly support the government funding research. The Petroleum industry exhibited the strongest level of support for this initiative (87%) while the Chemical industry showed the strongest level of opposition (44%). When those respondents who expressed a neutral position (i.e., who neither support nor oppose) are factored out, the percentage of overall support climbs to 67%. The level of support of government intervention through funding was much higher than anticipated.

(ii) Sponsor Conferences

The responses for Initiative B are given in Table 4.3.5B.

"Initiative B: Sponsor environmental auditing conferences and workshops".

Among the 74 respondents who completed this question, 68% either mildly (50%) or strongly (18%) support the sponsoring of conferences or workshops; only 12% either mildly (8%) or strongly (4%) oppose this activity. This level of support is reflected in both categories of respondents, with a 71% expression of support from Group A respondents and a 61% expression of support from all others. Again, the Petroleum industry led all others with 87% of respondents in support. This was followed closely by the Food/Beverage industry (86%), the Chemical industry (71%), and the Pulp and Paper industry (67%).

Among those respondents expressing an opinion (ie. with those who answered "3" factored out), the figures climb even higher. Overall, 85% showed support for this role (either mild or strong). Among the first category of respondents this figure was 95%!

TABLE 4.3.5A

POTENTIAL GOVERNMENT INITIATIVES

Initiative A:
Fund research projects aimed at promoting the environmental auditing state-of-the-art.

	GROUP A					GROUP B					TOTAL				
Sector	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Chemical	5(42%)	1(8%)	3(25%)	3(25%)	-	-	-	2(100%)	-	-	5(36%)	1(8%)	5(36%)	3(21%)	-
Petroleum	-	-	1(20%)	2(40%)	2(40%)	-	-	-	2(67%)	1(33%)	-	-	1(13%)	4(50%)	3(37%)
Pulp & Paper	1(17%)	1(17%)	-	4(67%)	-	1(17%)	-	3(50%)	2(33%)	-	2(17%)	1(8%)	3(25%)	6(50%)	-
Mining	-	-	2(50%)	1(25%)	1(25%)	1(20%)	-	3(60%)	1(20%)	-	1(11%)	-	5(55%)	2(22%)	1(11%)
Steelmaking	-	-	-	1(100%)	-	1(100%)	-	-	-	-	1(50%)	-	-	1(50%)	-
Utilities	-	-	4(50%)	4(50%)	-	-	-	1(100%)	-	-	-	-	5(55%)	4(44%)	-
Technology/Equipt.	1(25%)	1(25%)	-	1(25%)	1(25%)	-	-	-	1(100%)	-	1(20%)	1(20%)	-	2(40%)	1(20%)
Food/Beverage	1(50%)	-	-	-	1(50%)	-	2(40%)	2(40%)	1(20%)	-	1(14%)	2(29%)	2(29%)	1(14%)	1(14%)
Aggregate	-	1(50%)	-	1(50%)	-	-	-	-	1(100%)	-	-	1(33%)	-	2(67%)	-
Automotive	-	-	1(50%)	1(50%)	-	-	-	-	-	-	-	-	1(50%)	1(50%)	-
Tire Mfg.	-	-	1(50%)	1(50%)	-	-	-	-	1(100%)	-	-	-	1(33%)	2(67%)	-
TOTAL	8(17%)	4(8%)	12(25%)	19(40%)	5(10%)	3(11%)	2(8%)	11(42%)	9(35%)	1(4%)	11(15%)	6(8%)	23(31%)	28(38%)	6(8%)
	(22%)	(11%)	X	(53%)	(14%)	(20%)	(13%)	X	(60%)	(7%)	(21%)	(12%)	X	(55%)	(12%)

1 - Strongly oppose
2 - Mildly oppose
3 - Neither support nor oppose
4 - Mildly support
5 - Strongly support

Group A - Those who currently conduct or plan to conduct
Group B - All others

TABLE 4.3.5B

SPONSOR ENVIRONMENTAL AUDITING WORKSHOPS AND CONFERENCES

Initiative B:
Sponsor environmental auditing workshops and conferences.

	GROUP A					GROUP B					TOTAL				
Sector	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Chemical	1(8%)	-	2(17%)	6(50%)	3(25%)	-	-	1(50%)	1(50%)	-	1(8%)	-	3(21%)	7(50%)	3(21%)
Petroleum	-	-	1(20%)	2(40%)	2(40%)	-	-	-	1(33%)	2(67%)	-	-	1(13%)	3(37%)	4(50%)
Pulp & Paper	-	-	1(17%)	4(67%)	1(17%)	-	2(33%)	1(17%)	2(33%)	1(17%)	-	2(17%)	2(17%)	6(50%)	2(17%)
Mining		-	2(50%)	1(25%)	1(25%)	1(20%)	2(40%)	-	1(20%)	1(20%)	1(12%)	2(22%)	2(22%)	2(22%)	2(22%)
Steelmaking	-	-	-	1(100%)	-	-	1(100%)	-	-	-	-	1(50%)	-	1(50%)	-
Utilities	-	-	3(37%)	5(63%)	-	-	-	-	1(100%)	-	-	-	3(33%)	6(67%)	-
Technology/Equipt.	1(25%)	-	-	2(50%)	1(25%)	-	1(100%)	-	-	-	1(20%)	1(20%)	-	2(40%)	1(20%)
Food/Beverage	-	-	1(50%)	-	1(50%)	-	-	-	5(100%)	-	-	-	1(14%)	5(72%)	1(14%)
Aggregate	-	-	1(50%)	1(50%)	-	-	-	-	1(100%)	-	-	-	1(33%)	2(67%)	-
Automotive	-	-	-	-	-	-	-	-	2(100%)	-	-	-	-	2(100%)	-
Tire Mfg.	-	-	1(50%)	1(50%)	-	-	-	1(100%)	-	-	-	-	2(67%)	1(33%)	-
TOTAL	2(4%)	-	12(25%)	25(52%)	9(19%)	1(4%)	6(23%)	3(11%)	12(48%)	4(15%)	3(4%)	6(8%)	15(20%)	37(50%)	13(18%)
	(5%)		X	(70%)	(25%)	(4%)	(26%)	X	(52%)	(17%)	(5%)	(10%)	X	(63%)	(22%)

1 - Strongly oppose
2 - Mildly oppose
3 - Neither support nor oppose
4 - Mildly support
5 - Strongly support

Group A - Those who currently conduct or plan to conduct
Group B - All others

The high levels of support for Initiatives A and B suggest that there is a keen interest to learn more about environmental auditing among private sector firms. And furthermore, that industry feels that the government is an appropriate body to promote advancement up the learning curve.

(iii) Act as Clearinghouse

The responses for Initiative C are given in Table 4.3.5C.

"Initiative C: Act as a "clearinghouse" on auditing practices to help companies learn from one another."

As this table reveals, the level of support for this initiative is substantially lower than for the first two initiatives. Although there was still a greater level of support for this initiative than opposition, of the 73 respondents who completed this question, only 38% expressed either mild or strong support for "acting as a clearinghouse"; 23% were opposed to it. When those expressing a neutral position are factored out, 38% of respondents are opposed, either mildly or strongly, to this initiative.

Interestingly, respondents without auditing programs (Group B) showed a greater level of support for this initiative (50%) than did those with programs or plans for programs (Group A) (32%).

(iv) Public Endorsement

Table 4.3.5D gives the responses to Initiative D:

"Initiative D: Support and publicly endorse private sector auditing efforts".

As can be seen from this table, there is a relatively high level of support (61%) (either strong or mild) for this initiative among the 72 respondents who completed this question. Only 18% were opposed to it. This level of support is reflected in virtually every industrial sector, with the exception of the Pulp and Paper industry.

TABLE 4.3.5C

ACT AS A CLEARING HOUSE

Initiative C:
Act as a "clearinghouse" on auditing practices to help firms learn from one another.

	GROUP A					GROUP B					TOTAL				
Sector	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Chemical	3(25%)	1(8%)	4(33%)	2(16%)	2(16%)	-	-	1(50%)	1(50%)	-	3(21%)	1(7%)	5(36%)	3(21%)	2(14%)
Petroleum	-	-	1(25%)	1(25%)	2(50%)	-	1(33%)	-	2(67%)	-	-	1(14%)	1(14%)	3(43%)	2(28%)
Pulp & Paper	-	-	5(83%)	-	1(17%)	-	1(17%)	3(50%)	1(17%)	1(17%)	-	1(8%)	8(67%)	1(8%)	2(17%)
Mining	1(25%)	-	2(50%)	1(25%)	-	1(20%)	1(20%)	1(20%)	1(20%)	1(20%)	2(22%)	1(11%)	3(33%)	2(22%)	1(11%)
Steelmaking	-	-	-	-	1(100%)	-	-	1(100%)	-	-	-	-	1(50%)	-	1(50%)
Utilities	-	1(13%)	4(50%)	1(13%)	2(25%)	-	-	-	1(100%)	-	-	1(11%)	4(44%)	2(22%)	2(22%)
Technology/Equipt.	1(25%)	-	2(50%)	1(25%)	-	-	1(100%)	-	-	-	1(20%)	1(20%)	2(40%)	1(20%)	-
Food/Beverage	-	1(50%)	-	-	1(50%)	-	1(20%)	-	4(80%)	-	-	2(29%)	-	4(57%)	1(14%)
Aggregate	1(50%)	1(50%)	-	-	-	-	-	1(100%)	-	-	1(33%)	1(33%)	1(33%)	-	-
Automotive	1(50%)	-	1(50%)	-	-	-	-	-	-	-	1(50%)	-	1(50%)	-	-
Tire Mfg.	-	-	2(100%)	-	-	-	-	-	1(100%)	-	-	-	2(67%)	1(33%)	-
TOTAL	7(15%)	4(8%)	21(45%)	6(13%)	9(19%)	1(4%)	5(19%)	7(27%)	11(42%)	2(8%)	8(11%)	9(12%)	28(30%)	17(23%)	11(15%)
	(27%)	(15%)	X	(23%)	(35%)	(5%)	(26%)	X	(58%)	(11%)	(18%)	(20%)	X	(38%)	(24%)

1 - Strongly oppose
2 - Mildly oppose
3 - Neither support nor oppose
4 - Mildly support
5 - Strongly support

Group A - Those who currently conduct or plan to conduct
Group B - All others

TABLE 4.3.5D

PUBLIC ENDORSEMENT

Initiative D:
Support and publicly endorse private sector auditing efforts.

	GROUP A					GROUP B					TOTAL				
Sector	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Chemical	3(27%)	-	2(18%)	4(36%)	2(18%)	-	-	1(50%)	1(50%)	-	3(23%)	-	3(23%)	5(38%)	2(15%)
Petroleum	-	-	-	2(50%)	2(50%)	-	1(33%)	1(33%)	1(33%)	-	-	1(14%)	1(14%)	3(43%)	2(28%)
Pulp & Paper	2(33%)	-	1(17%)	2(33%)	1(17%)	-	-	5(83%)	1(17%)	-	2(17%)	-	6(50%)	3(25%)	1(8%)
Mining	-	-	1(25%)	2(50%)	1(25%)	1(20%)	1(20%)	-	2(40%)	1(20%)	1(11%)	1(11%)	1(11%)	4(44%)	2(22%)
Steelmaking	-	-	-	-	1(100%)	-	-	1(100%)	-	-	-	-	1(50%)	-	1(50%)
Utilities	-	2(25%)	3(37%)	2(25%)	1(13%)	-	-	-	1(100%)	-	-	2(22%)	3(33%)	3(33%)	1(11%)
Technology/Equipt.	1(25%)	-	-	-	3(75%)	-	-	-	1(100%)	-	1(20%)	-	-	1(20%)	3(60%)
Food/Beverage	-	-	-	1(50%)	1(50%)	-	1(20%)	-	4(80%)	-	-	1(14%)	-	5(72%)	1(14%)
Aggregate	-	-	-	2(100%)	-	-	-	-	-	1(100%)	-	-	-	2(67%)	1(33%)
Automotive	1(50%)	-	-	1(50%)	-	-	-	-	-	-	1(50%)	-	-	1(50%)	-
Tire Mfg.	-	-	-	1(50%)	1(50%)	-	-	-	1(50%)	-	-	-	-	2(67%)	1(33%)
TOTAL	7(15%)	2(4%)	7(15%)	17(37%)	13(28%)	1(4%)	3(12%)	8(31%)	12(46%)	2(8%)	8(11%)	5(7%)	15(21%)	29(40%)	15(21%)
	(18%)	(5%)	X	(44%)	(33%)	(6%)	(16%)	X	(67%)	(11%)	(14%)	(8%)	X	(51%)	(26%)

1 - Strongly oppose
2 - Mildly oppose
3 - Neither support nor oppose
4 - Mildly support
5 - Strongly support

Group A - Those who currently conduct or plan to conduct
Group B - All others

It is hardly surprising that private companies would support such an initiative. There would be tremendous public relations value in government (public) recognition and endorsement of private environmental auditing efforts, and they know it. If such an initiative were to become a reality, it would of course be imperative that such an endorsement was based on the demonstrated commitment of the company to act on audit findings in a positive manner.

(v) Voluntary Incentive-Based Program

Table 4.3.5E presents the responses to Initiative E.

"Initiative E: Develop a voluntary 'incentives-based' approach similar to the U.S. Environmental Protection Agency's."

Before discussing these results, it must be noted that they should be taken with a 'grain of salt'. It is possible that some respondents were unfamiliar with the E.P.A.'s proposal and the reaction it received from private companies (but answered the question anyways). Needless to say, it was difficult to adequately explain the E.P.A.'s approach in a one-line question.

Notwithstanding the above, from Table 4.3.5E it can be seen that of the 73 respondents who completed this question, 51% were in support of this initiative (either mildly or strongly), while 30% were opposed to it (either mildly or strongly). These findings were relatively consistent for both categories of respondents. In the Chemical industry, 35% of respondents were opposed to the initiative, while only 21% were in support of it. For the Petroleum industry, an equal number of firms (38%) were against it as were in support of it. By way of contrast, in the Mining industry, 77% of respondents were in support, while 22% were against it.

These findings are consistent with the experience in the U.S. There, as in Canada, industry feelings regarding this type of government program were mixed. Some were for it, some against it.

TABLE 4.3.5E

VOLUNTARY, INCENTIVES-BASED PROGRAM

Initiative E:
Develop a voluntary 'incentive-based' approach similar to the U.S. E.P.A.'s.

	GROUP A					GROUP B					TOTAL				
Sector	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Chemical	4(33%)	1(8%)	4(33%)	1(8%)	2(17%)	-	-	1(50%)	-	1(50%)	4(28%)	1(7%)	5(36%)	1(7%)	2(14%)
Petroleum	-	1(20%)	1(20%)	2(40%)	1(20%)	1(33%)	1(33%)	1(33%)	-	-	1(13%)	2(25%)	2(25%)	2(25%)	1(13%)
Pulp & Paper	1(17%)	1(17%)	-	3(50%)	1(17%)	2(33%)	1(17%)	1(17%)	2(33%)	-	3(25%)	2(17%)	1(8%)	5(42%)	1(8%)
Mining	-	-	-	2(50%)	2(50%)	2(40%)	-	-	1(20%)	2(40%)	2(22%)	-	-	3(33%)	4(44%)
Steelmaking	-	-	-	1(100%)	-	-	1(100%)	-	-	-	-	1(50%)	-	1(50%)	-
Utilities	-	1(14%)	4(57%)	2(28%)	-	-	-	-	1(100%)	-	-	1(13%)	4(50%)	3(37%)	-
Technology/Equipt.	1(25%)	-	-	2(50%)	1(25%)	-	-	-	1(100%)	-	1(20%)	-	-	3(6%)	1(20%)
Food/Beverage	-	-	1(50%)	-	1(50%)	-	2(40%)	-	2(40%)	1(20%)	-	2(29%)	1(14%)	2(29%)	2(29%)
Aggregate	-	1(50%)	-	-	1(50%)	-	-	-	1(100%)	-	-	1(33%)	-	1(33%)	1(33%)
Automotive	-	1(50%)	1(50%)	-	-	-	-	-	-	-	-	-	1(50%)	-	-
Tire Mfg.	-	-	-	1(50%)	1(50%)	-	-	-	1(100%)	-	-	-	-	2(67%)	1(33%)
TOTAL	6(13%)	6(13%)	11(23%)	14(30%)	10(21%)	5(19%)	5(19%)	3(12%)	9(35%)	4(15%)	11(15%)	11(15%)	14(19%)	23(32%)	14(19%)
	(17%)	(17%)	X	(30%)	(27%)	(22%)	(22%)	X	(39%)	(17%)	(17%)	(17%)	X	(30%)	(24%)

1 - Strongly oppose
2 - Mildly oppose
3 - Neither support nor oppose
4 - Mildly support
5 - Strongly support

Group A - Those who currently conduct or plan to conduct
Group B - All others

(vi) Mandatory Program

Table 4.3.5F presents the results of the final initiative.

"Initiative F: Develop a mandatory, third party scheme similar to external financial auditing."

Again, before discussing these results it is likely that some respondents were unfamiliar with the U.S. Environmental Protection Agency's mandatory proposal and its full ramifications. Results should be judged in this light.

As Table 4.3.5F reveals, the overwhelming majority of the 74 respondents who completed this question were opposed to this initiative: 66% strongly, and 16% mildly (total of 72%). If those who expressed a neutral position are factored out, the combined total of those opposed becomes 93%. This was relatively consistent across all industrial sectors. Although these opinions were reflected by both categories of respondents, the percentage of those respondents who currently conduct or plan to conduct environmental auditing who were opposed was slightly greater than for the others.

These figures are not surprising and they are quite consistent with the general reaction of U.S. private industry when the E.P.A. proposed this initiative. There, reaction was overwhelmingly negative.

Overall, Question 56 reveals that the majority of industry is in support of the government playing a passive role -- promoting and encouraging the use of environmental auditing as a good management practice. However, most companies are opposed to any type of active government role which places further control over environmental protection in the hands of the public sector.

Some of the interesting comments by respondents received include:

"By regulating environmental auditing, government agencies are regulating how companies manage their affairs. This smacks of Big Brother. Government should only regulate output".

TABLE 4.3.5F

MANDATORY PROGRAM

Initiative F:
Develop a mandatory, third party scheme similar to external financial auditing.

	GROUP A					GROUP B					TOTAL				
Sector	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Chemical	9(75%)	1(8%)	2(16%)	-	-	-	1(50%)	1(50%)	-	-	9(64%)	2(14%)	3(21%)	-	-
Petroleum	2(50%)	2(50%)	-	-	-	3(100%)	-	-	-	-	5(71%)	2(29%)	-	-	-
Pulp & Paper	4(67%)	-	1(17%)	-	1(17%)	5(83%)	-	1(17%)	-	-	9(75%)	-	2(16%)	-	1(8%)
Mining	4(100%)	-	-	-	-	3(60%)	1(20%)	-	-	1(20%)	7(77%)	1(11%)	-	-	1(11%)
Steelmaking	1(100%)	-	-	-	-	1(100%)	-	-	-	-	2(100%)	-	-	-	-
Utilities	5(63%)	1(13%)	2(25%)	-	-	1(100%)	-	-	-	-	6(67%)	1(13%)	2(25%)	-	-
Technology/Equipt.	2(50%)	2(5%)	-	-	-	-	1(100%)	-	-	-	2(40%)	3(60%)	-	-	-
Food/Beverage	1(33%)	1(33%)	1(33%)	-	-	3(60%)	-	1(20%)	-	1(20%)	4(50%)	1(13%)	2(25%)	-	1(13%)
Aggregate	1(50%)	1(50%)	-	-	-	1(100%)	-	-	-	-	2(67%)	1(33%)	-	-	-
Automotive	2(100%)	-	-	-	-	-	-	-	-	-	2(100%)	-	-	-	-
Tire Mfg.	1(50%)	1(50%)	-	-	-	-	-	-	-	-	1(50%)	1(50%)	-	-	-
TOTAL	32(67%)	9(19%)	6(13%)	X	1(2%)	17(65%)	3(1%)	3(11%)	1(4%)	2(8%)	49(66%)	12(16%)	9(12%)	1(1%)	3(4%)
	(76%)	(21%)	X	X	(2%)	(74%)	(13%)	X	(4%)	(9%)	(75%)	(18%)	X	(2%)	(5%)

1 - Strongly oppose
2 - Mildly oppose
3 - Neither support nor oppose
4 - Mildly support
5 - Strongly support

Group A - Those who currently conduct or plan to conduct
Group B - All others

"The voluntary approach is good. Government should provide a framework for such programs".

"Regulations shouldn't tell companies how to manage. They don't know themselves — they don't have business expertise or understand business problem solving".

"There doesn't need to be a quid pro quo" [when firms establish an audit program].

"If government is involved, audits will be protective — not open and helpful".

"Those of us who spend the time and money in this area [compliance and auditing] do not intend to be subjected to regulations which are intended to force the less progressive companies to do what is proper".

"...priorities for environmental control should be internal through the Internal Responsibility System rather than imposed by government. Government's role should be to audit the company's programs to determine their effectiveness".

"Your time and government funds (which come from taxpayers) will be better spent if you will devote your effort into some problems dealing directly with environmental problems rather than on administrative stuff with questionable value".

"We have enough government intervention now! Do not create another civil service ivory tower function. Leave it to the private sector".

"Canada is getting more than its fair share of government and we should be alert to preventing that share from getting bigger".

4.4 SUMMARY

Overall, Canadian industry appears to be quite positive and optimistic about environmental auditing. There is a high level of awareness of the practice, and the already substantial number of users is growing. The survey found that the majority of respondents felt that there is a need for environmental auditing, that other companies could benefit from and should be encouraged to establish auditing programs, and that the number of firms with auditing programs will increase in the next 5 years. Finally, there seems to be industry support for the government to play a passive, if any, role with respect to private auditing.

5.0 CHARACTERISTICS OF EXISTING PROGRAMS

Respondents who reported that they currently conduct environmental auditing programs (from Question 2) were directed to complete Questions 18 - 60. These questions were designed to document certain characteristics of operating programs, including for example, their objectives, staffing, scope, techniques, reporting and follow-up. From these answers, it was hoped to gain a feel for how Canadian firms conduct their audits, in relation to both other Canadian firms, and firms in the United States.

Only the 20 existing bona fide programs were analysed in this section. Because each industrial sector was not represented equally, a sector by sector comparison is difficult and, statistically meaningless. Differences in approach to auditing between sectors will be noted when they are significant enough to warrant.

5.1 PROGRAM PARTICULARS

5.1.1 Title

Question 18: "What is the program's title?"

The most common program title reported in the survey was "Environmental Audit". Variations of this included "Corporate Environmental Audit", "Environmental Compliance Audit" or "Health, Safety and Environmental Audit". Another commonly reported title was "Environmental Review". Variations included "Corporate Environmental Affairs Review" and "Industrial Environmental Performance Review". The titles "Environmental Survey" and "Environmental Status Report" were also used.

Program titles varied both within and across industrial sectors: a cut and dried trend could not be identified. However, in the Chemical industry, the leaning is towards "audit". By contrast, the Petroleum and Automotive industries favour "review". No attempt was made in the questionnaire to determine why a particular title was selected. Subsequent follow-up however, revealed that more often that not, "review" (or

variations) is selected deliberately to avoid the use of "audit". "Audit" is often considered a 'harsh' term, with connotations to external financial auditing and a 'policing' role. Many programs (even those using "audit" in the title) do not want to appear to be policing and fault finding functions.

> One person observed,
> "The term "audit" leaves the insinuation that people are not fulfilling their jobs".

5.1.2 Year Established

Question 19: "In what year was it established?"

The overwhelming majority of programs (approximately 70%) were initiated since 1980, many of those in the last two years. In addition, two programs were started in the late 1960's, one in 1972, and three in 1979.

Again, though no clear cut industrial sector conclusions can be drawn, certain Chemical and Automotive companies have been using this management tool for quite some time.

5.1.3 Number of Audits Conducted

Question 21: "How many audits have been conducted to date?"

The number of audits conducted by individual firms vary considerably. Somewhat surprisingly, there is not a direct and consistent relationship between the age of the program and the number of audits conducted. Factors which intervene include the number of operating facilities to be audited and the intended frequency of audits at each operating facility in relation to program objectives.

In general, those firms who had established their programs since 1980 had conducted only one to five audits. (Although one 1981 program had conducted 21 audits and a 1983 program had conducted seven.) For programs established prior to 1980, there was again considerable variation in the number of audits conducted. Some had audited yearly at each operating facility of the company; others were not as regular.

5.1.4 Responsibility

Question 21: "Where does responsibility for the program lie?" (What department, division)

The aim of this question was to determine where organizationally within the company (plant, division, corporate), and in what department, the environmental audit program was housed. Unfortunately, in some cases, the degree of specifity sought was not obtained: Though the department was given, the level was not.

(i) Department

The majority of programs were housed in departments specifically created to address environmental concerns of the company. These included "Environmental Affairs", "Environmental Control", "Health, Safety and Environment", "Environmental Services", "Environment" departments and so on. A few programs were contained in "Engineering" and "Technical" departments. One was operated out of the "Risk and Insurance Management" department.

(ii) Level

In at least four of the current programs reviewed, responsibility for the program was with the United States parent company. Of the remaining programs who indicated the level of responsibility, all but two were housed at the Corporate level. One firm reported joint responsibility between corporate and plant management; one other was contained at the plant management level.

5.1.5 Objectives

Question 22: "What are the principal objectives of the program?"

This question revealed that environmental auditing programs are used for a great variety of reasons. In all, 20 distinct categories of program objectives were reported by the respondents. These are presented in Table 5.1.5. These appear in an order which reflects the number of times a given objective was reported, and are not ranked according to importance.

TABLE 5.1.5 - REPORTED PROGRAM OBJECTIVES

- Measure and/or verify compliance with environmental regulations (air, water, land, waste)
- Identify and/or anticipate environmental problems; eliminate surprises
- Evaluation of environmental performance of company
- Compliance with company/corporate policies
- Identify environmental risks and hazards
- Identify corrective action; make recommendations
- Avoid fines and damage claims; limit corporate liability; avoid costly remedial solutions
- Perform cost/benefit analysis of environmental control technology; record investment and expenditures on pollution control
- Assessment of progress in solving environmental problems
- Develop data base; information for senior management
- Provide assistance/resources to plant management
- Minimize exposure to employees; safety/hygiene concerns
- Enhance employee awareness
- Technology exchange
- Insurance purposes
- Inventory of: concerns; emissions; abatement equipment; hazardous wastes; spills
- Forecast future environmental plans/programs
- Improve internal reporting
- Improve compliance with regulations and policies
- Provide models of good programs

As Table 5.1.5 indicates, verifying compliance with environmental regulations and corporate policies is a common thread among the majority of environmental auditing programs. This is especially so in the Chemical industry. Environmental auditing programs are also used to identify and anticipate environmental problems, risks and hazards.

During many personal and telephone interviews, the question of whether environmental auditing is 'efficiency' or 'effectiveness' oriented, was raised. While the two aims are not mutually exclusive, they do entail different emphasis of approach during the audit, and would perhaps be conducted for different reasons. Table 5.1.5 reveals that only a few respondents identified 'cost-effectiveness', 'cost benefit analysis', and "avoid fines" type of measures as being included in their program objectives. Cost-savings, or conversely, increased efficiency were not reported as being the most important objectives of environmental auditing programs. By contrast, the majority of programs were effectiveness oriented, as indicated by objectives such as "problem identification" (and correction), "performance evaluation", "employee awareness", "technology exchange", "assessment of problem solving", and "data-base gathering". Furthermore, objectives appear to be aimed at both providing assurance to upper management that control systems are operating as intended and providing assistance and resources to facility management.

Some general comments included,

"Audits must be seen as supporting, not critical".

"Environmental auditing is good for communication, identifying overlap, clarifying responsibility in a given location".

"One must be clear about the objectives and the information sought".

"If it didn't save money, why would a firm engage in it? The problem is how to identify cost-savings. Often, these are future liabilities".

"Our focus is to be of service, assist".

"Our audit is more of a baseline assessment. It is an audit of management systems with no verification".

5.2 SCOPE OF ENVIRONMENTAL AUDITING PROGRAMS

5.2.1 Areas of Review

Question 23: "Which of the following are audited at each operating facility?"

Table 5.2.1 reveals that a very high percentage of respondents audit or review the regulations/permits for air, water, and land discharges, corporate and plant level environmental policies, monitoring requirements and practices, reporting requirements and practices, on-site pollution control units, and environmental emergency response. Several companies reported auditing each of the areas of review identified in this table. Though this list was not intended to be exhaustive, an audit program which addressed all of these items would be quite comprehensive.

60% and 55% of respondents address worker safety and worker health respectively as part of the environmental audit program, including 100% of those companies whose programs are housed in a "Health, Safety and Environment" type of department. This is not surprising because of the direct relationship between safety, health and environmental issues. Several other respondents indicated that safety and health concerns were addressed by other existing auditing programs.

TABLE 5.2.1 - SCOPE - AREAS OF REVIEW

	Area of Review	Response (% of respondents who who selected this option)
A.	Regulations/permits for air emissions	90%
B.	Regulations/permits for water discharges	90%
C.	Regulations/permits for land discharges	85%
D.	Regulations/permits for waste disposal	90%
E.	Regulations/permits for transportation	60%
F.	Corporate or plant environmental policies	95%
G.	Monitoring requirements and practices	85%
H.	Reporting requirements and practices within the company	85%
I.	Reporting and notification to external authorities	75%
J.	Management systems and controls	65%
K.	Operating units for pollution control: on-site	75%
L.	Operating units for pollution control: off-site	55%
M.	Monitoring/sampling equipment	65%
N.	Employee training programs	65%
O.	Environmental emergency response	90%
P.	Worker safety	60%
Q.	Worker health	55%
R.	Loss prevention	40%
S.	Complaint handling	45%
T.	Filing systems	35%
U.	Laboratory testing equipment and protocols	45%
V.	Routine maintenance	40%

Other areas of review identified by the respondents included "risk identification", "organization for environmental control", "noise pollution", "outside processors (contractors processing our materials)", "product stewardship", "handling of special wastes", and "priority list of remaining environmental problems".

General comments from respondents included,

"Our main orientation is on the effectiveness of management systems and controls".

"Focus depends on line manager's needs... these will vary from site to site".

"I like to think that auditing does not address only regulated risks and standards".

5.2.2 Application

Question 24: "Are all of your company's operating facilities audited?"

This question was designed to determine the scope of application of an environmental audit program throughout the company. 75% of the respondents reported that all operating facilities in the company were audited. One "yes" was qualified to include "all manufacturing facilities". There were no detectable differences among industrial sectors. From those who audit only select operating facilities within the company came the following comments:

"Some of our facilities do not present a significant threat to the environment".

"In the process".

"We did not have enough time".

"This is up to line managers. Some have not requested the service".

""No" due to definition - what is an operating facility? If the question was directed at manufacturing facilities, then "yes"".

"Program was introduced into one division. As yet, not applied in all divisions, but the eventual plan is to cover the whole company".

5.2.3 Audit Frequency

Question 25: "How frequently is each operating facility audited?"

The frequency with which individual companies audit their operating facilities varies considerably. Of those respondents who completed this question (two did not and two stated that the frequency of review had not yet been established) over 60% audit their facilities at least once per year. This was especially so for companies in the Chemical industry. A further 28% audit each facility every two years. Other frequencies included: "once every 3 to 5 years", "every 2 years for big facilities, every 5 for small facilities", and "as often as line management requires".

Follow-up interviews revealed that as often as not, the availability of resources (human and financial) was a controlling factor in the frequency set. Environmental auditing may be only one of several responsibilities of environmental staff. In some companies yearly audits were simply not feasible or cost-effective. Others qualified that sentiment by saying that it is better to conduct a comprehensive, meaningful audit at 'long' intervals than a superficial one at 'short' intervals.

5.3 PERSONNEL

Questions 26 - 29 were designed to document details regarding the personnel involved in conducting the environmental audits.

5.3.1 Outside Consultants

Question 26: "Do outside consultants play a role with regards to your environmental auditing program?"

Over 85% of the respondents reported that outside consultants do not play a role in their auditing program. This reflects a desire to internalize the auditing function and to build in-house expertise. Those who do use outside consultants were asked to define the role played. In two companies, outside consultants conducted the audits; in one, consultants assisted in the design of the audit program but left its conduct

to in-house personnel. Both of those who used outside consultants to conduct the audits did so for insurance purposes: an external audit was required.

5.3.2 Individual or Team

> Question 27: "Is your audit program conducted by an individual or a team?
>
> If "individual", what department or division does he/she represent?
>
> If "team", how many team members?" For each member, indicate department/division."

Five of the 19 respondents who completed this question (26%) reported that their audits are conducted by an individual. The department's represented by these individuals include: "Facility Engineering"; "Corporate Engineering"; "Risk and Insurance Management"; "Corporate Environment"; and, "Environmental Services". Both Pulp and Paper companies represented use individuals to conduct their audits, though this is not necessarily representative of the industry as a whole. The remaining 74% of respondents reported that their audits are conducted by a team. Team size varies anywhere from two to five members, with an average of about three.

The follow-up question regarding team composition was not answered in a consistent fashion by each respondent. This made analysis difficult. In an absolute sense, quite a range of departments were represented, including "Corporate Environmental Affairs", "Environmental Control", "Engineering", "Industrial Hygiene", "Medical", "Safety", "Health and Safety", "Research and Development", "Laboratory", "Legal", "Reclamation", "Manufacturing", and "Plant Management".

Seven of the twelve respondents who completed the follow-up question (58%) had representation from either an "Industrial Hygiene" or "Medical" type of department. Only two companies reported legal representation on the audit team (although some form of legal input was obtained on an informal or select basis on many others). Only three companies reported using the client line managers as a formal member of the audit team, although such individuals often play some role during the

on-site investigation. One company reported exclusive use of site personnel to conduct the audits.

In addition, one company reported using plant personnel from another manufacturing location.[1] Several companies in the United States have used this staffing technique with tremendous success. Using personnel from other locations on a continually shifting basis aids in the cross-fertilization of ideas, increases communication, and enhances the expertise and familiarity of audit team members.

This question revealed that a variety of disciplines are involved in environmental auditing. These include for example, engineers, industrial hygienists, chemists, lawyers, and environmental specialists.

5.3.3 Inputs

Table 5.3.3 lists the options given in Question 28 as well as the respondents answers:

TABLE 5.3.3 - INPUTS TO THE AUDITING PROCESS

Question 28:
"In addition to those departments listed in Question 27, which of the following had input into the design and/or conduct of your program?"

	Department	Response - (% of those who completed this option)
A.	Internal Financial Auditing	6%
B.	Legal	53%
C.	Occupational Health	53%
D.	Safety	53%
E.	Manufacturing	47%
F.	Toxicology	41%
G.	Top Corporate Management	59%
H.	Other Operating Facility Personnel	35%

---

[1] In this instance, subsequent follow-up revealed that this individual did not participate in the actual on-site investigation, only in the design of the program.

As Table 5.3.3 reveals, a variety of inputs are used in the auditing exercise. (The extent to which such input is used was not questioned.) The high rate of response for "Top Corporate Management" (59%) reinforces the belief that environmental auditing programs should have the support of upper management. Also, although only two companies had legal representation on the audit team (from section 5.3.2), 53% of respondents reported that the legal department had input to the design or conduct of the program. Other inputs identified in the space provided, included: "help from financial and product audits", "consulting company", "vendors supplying environmental services, for example, waste disposal", and "quality control laboratory staff".

5.3.4 Training

Question 29: "Has the audit manager/team received formal training in (environmental) auditing techniques?

If "yes", who conducted this training?"

63% of the respondents reported that they had not received formal training in environmental auditing techniques. This is not surprising since there are few places, aside from consulting firms, one can go to for environmental audit training. Of those seven companies who reported that formal training had been received, three were trained by "experienced in-house personnel", and two were trained "by profession". It is possible that "by profession" was a reference to a discipline and not to specific auditing techniques. Only one company reported that training was conducted by an outside consultant.

General comments regarding personnel included:

"This is our audit of us [plant management] for us by them".

"Corporate people act as the consultants. Operating personnel are the clients".

"There is a fine line distinction between being familiar with operations and being too close".

5.4 GATHERING AUDIT INFORMATION

Questions 30 - 37 were developed to document the methods used to gather information.

5.4.1 On-site Investigation

Table 5.4.1 presents the responses to Questions 30 - 33. These questions addressed the on-site investigation, asking "Is an on-site investigation conducted? How many members participate? How long does it take? Is the audited facility notified prior to the on-site visit, and if so, how long before?"

As this Table reveals, 95% of the respondents reported that an on-site investigation is conducted by the audit team/manager. This figure was collaborated during personal interviews, where many individuals stressed the importance of an on-site investigation by 'independent', 'outside' personnel. Indeed, the concepts of "fresh eyes" and "verification" are dependent on an appraisal by objective personnel. By and large, objectivity cannot be achieved by local personnel, particularly those with responsibility for audited functions. Observed one individual,

> "If there is no on-site visit, sounds like a unidirectional flow of information, and a biased one at that".

Table 5.4.1 reveals that the number of individuals who conduct the on-site investigation vary anywhere from one to seven, with an average of about three. These individuals can spend anywhere from a few hours to a few weeks to complete the on-site investigation, although the average is approximately four days. These appear to be individual decisions.

All respondents reported that they notify the targeted facility prior to the on-site visit. Some with as little time as one week, others with as much as five months. This too appears to be an individual decision. Surprise audits are not conducted, presumably so as to create a feeling of cooperation and assistance, and not one of hostility.

5.4.2 Audit Preparation

Table 5.4.2 presents the options listed in Question 34 and the percentage of respondents who selected each one.

As this table reveals, 80% of respondents review relevant environmental regulations and previous audit/inspection reports to prepare for the actual on-site investigation. 70% use personal observation, presumably in the form of a pre-audit tour, to gain familiarity with the location. Six companies make use of a pre-visit questionnaire. This is normally a questionnaire sent to and completed by the audited facility's management in advance of the on-site investigation. Such pre-visit questionnaires are an effective means of streamlining and focussing the on-site activities and, for these reasons, are a positive feature of any environmental auditing program.

TABLE 5.4.1 - ON-SITE INVESTIGATION

Question 30		Question 31	Question 32	QUESTION 33	
On-Site Investigation?		How Many?	How Long?	Notify?	How Long Prior?
No	Yes			No Yes	
	1	1 - 6	Throughout Year	1	Is Expected at Year-End
	1	1 - 3	1 - 3 Days	1	1 Month
	1	3	5 Days	1	3 Months
	1	2	1 - 2 Days	1	2 - 4 Weeks
	1	3	5 Days	1	3 - 4 Weeks
	1	1	2 Days	1	1 - 2 Weeks
	1	2	3 - 4 Hours	1	1 - 2 Weeks
	1	3 - 5	5 Days	1	4 - 5 Months
	1	2+	2 Hours - 4 Days	1	1 - 2 Weeks
	1	---	---	---	---
	1	1	1 Day	1	2 Weeks
	1	1	1 - 2 Days	1	1 Week
	1	Variable	2 - 4 Days	1	1 Month
	1	3+	2 - 3 Days	1	1 Month
	1	3 _ 5	5 Days	1	Varies
	1	3	1 Day	1	1 - 4 Weeks
	1	1	1 - 2 Days	1	Varies
	1	3 - 4	1 - 2 Weeks	1	1 - 2 Months
1		3	1 Day	1	3 Months
	1	5 - 7	5 Days	1	2 Weeks
1 (5%)	19 (95%)			19 (100%)	

TABLE 5.4.2 - AUDIT PREPARATION

Question 34: "How does your audit team/manager prepare for the on-site investigation?"

	Activity	Response (% of those who selected each option).
A.	Review of previous audit/inspection reports	80%
B.	Review of regulations	80%
C.	Review of job-descriptions, internal organization	40%
D.	Review of process flows	50%
E.	Personal observation - on-site	70%
F.	Administer 'pre-visit' questionnaire	30%
G.	Formal briefings, interviews	45%

Other methods for preparation described in the space provided included:

"Correspondence; pre-audit questionnaire; pre-audit information package; environmental assessment; manual of plant site".

"Review inspection protocol".

"Review files; pre-audit visit".

"Review of permits on file in Corporate office".

5.4.3 Facility Preparation

Question 35: "Is the audited facility's management prepared for the on-site investigation by the audit manager/team?

If "yes", how?"

Only four of the 19 companies who completed this question (21%) did not prepare the audited facility's management for the on-site visit. Some of the methods identified by those who do prepare local management include:

"Provided with checklists".

"Informed of "audit" and its objectives previous to visit".

"Personal visit prior to audit".

"Pre-notification and meeting".

"Pre-audit visit; pre-questionnaire; draft on-site schedule".

"Advance request for pre-audit information package and team briefing".

"Pre-audit discussion and explanation of purpose".

5.4.4 Written Manual

Question 36: "Are the audit procedures and overall process documented in a written manual?"

Twelve of the 19 respondents to this question (63%) reported that their audit programs are documented in a written manual. Two others indicated that such a manual was in the process of being written.

5.4.5 Techniques

Table 5.4.5 presents the level of use of each of the options given in Question 37.

TABLE 5.4.5 - ON-SITE METHODS

Question 37: "Various methods, techniques and aids can be used to gather information on-site. Which of the following does your program use?"

	Method	Level of Use (% of those who selected each option)
A.	Checklists	72%
B.	Questionnaire	67%
C.	Physical inspection of pollution control equipment and devices	94%
D.	Physical inspection of operating units	89%
E.	Physical inspection of plant records, reports	89%
F.	Observation of daily practices	61%
G.	Interviews with operating personnel	83%
H.	Interviews with 3rd parties	17%
I.	External laboratory testing	22%
J.	Cameras	11%

Table 5.4.5 reveals that the most commonly used means of gathering information are (ranked according to level of use): inspection, interviews, use of checklists/questionnaires, and observation. This indicates as heavy a reliance on the auditor's perception, judgement and interpersonal skills when gathering information, as on 'mechanical' aids such as checklists.

During personal interviews, many individuals emphasized the need for an auditor to have strong interpersonal skills. Some felt that this was more important than technical skills or knowledge. As one individual observed,

> "Environmental auditing is very subjective, the checklists are only hardware".

Other general comments received during the investigation include:

> "Auditing is an art, not a science".
>
> "All audits are scheduled and auditees notified well in advance. This laid the foundation for good cooperation and assistance".
>
> "Asking questions does more than just get the answers. It will force an examination and supply red flags - experts come later".

5.5 REPORTING/FOLLOW-UP

5.5.1 Oral or Written Report?

> Question 38: "Are audit results presented orally or in a written report?
>
> If orally, who are the results presented to?
>
> If written or both, what is the typical length of the written report?"

Interestingly, not one company presented audit results in oral fashion only. Eleven of 20 respondents (55%) presented the audit results in both formats (that is, a written report and an oral presentation). Oral presentations were generally given to "upper" or "top" management. The remaining 45% of respondents presented audit results in a written report only. The length of these reports vary widely. Some as little as "3 - 10

pages", others in excess of 100 pages. The average length is approximately 25 pages.

5.5.2 Primary Addressee

The primary addressee of the audit report — the principle client of the auditing program — says a lot about the program and its purpose. Is it a program for upper managers? Or is it for the operating facility?

As Table 5.5.2 reveals, a large majority of companies (75%) identified the Plant Manager as the primary recipient of the final report. Of those, several reported that "Vice-President's" and "Senior Vice-President's" were also recipients. Two companies reported that each of Plant Manager, Chief Executive Officer and President were primary addressees. Not one company reported that the Chief Executive Officer was the (only) primary recipient; just one company identified the President as the (only) primary recipient. Three companies identified primary recipients not listed in the question. These included: "Executive Vice-President"; "Corporate Environmental Affairs Committee"; and "Risk and Insurance Management". Interestingly, of the four companies who did not identify the Plant Manager as the primary recipient of the audit report, three identify him in Question 40 as someone else the report is distributed to. Taken with the above, this reinforces the belief that environmental auditing serves both corporate and plant management.

From Question 40, "Who else is the final report distributed to?", other recipients were identified as: "Staff Manufacturing"; "Director of Plant Engineering"; "Insurer"; "All other managers interviewed"; "Team Members"; "C.E.O."; "Anybody who asks"; "Director of Environmental Affairs"; "Site Participants in Audit"; "Chief Engineer"; "Those responsible for implementing recommendations"; and "No one [just Plant Manager and Senior Vice-President]".

It is clear that audit reports receive relatively wide distribution throughout corporations, from the line to top level. This is what an effective environmental audit program should do — transmit information throughout the corporate hierarchy.

TABLE 5.5.2 - PRIMARY ADDRESSEE OF REPORT

Question 39: "Who is the primary addressee of the final report?"

	Position	Response
A.	Plant Manager	15 (75%)
B.	Chief Executive Officer	2 (10%)
C.	President	3 (15%)

5.5.3 Time Lag

Question 42: "What is the average time lag between the on-site investigation and the presentation of audit results?"

Like other features of environmental auditing programs, the period of time required to prepare and present audit findings varies from company to company. It is suspected that this is a function of, among other things, the depth and scope of the audit findings and of the time available to the audit team/manager. The survey found that the time lag varies anywhere from one week to three months. The average is approximately four to five weeks.

5.5.4 Types of Information

Question 41: "What types of information are presented in the final audit report?"

Due to the open-ended nature of this question, the types of responses varied widely and were thus difficult to compare and analyse statistically. Most firms include a measure of the overall effectiveness of environmental control procedures and programs, the status of compliance with regulations, permits and/or policies, and the presence of or potential for environmental problems, hazards and risks. Over half of the companies include recommendations for improvement or actions necessary to comply with environmental requirements in the report.

Several companies report both the positive and negative aspects of a given operation -- a balanced view. This position was stressed over and over again in personal interviews: Environmental auditing should not

be used strictly as a negative, critical tool. It will be viewed as being far more effective and palatable if praise is given where praise is due.

The following are a cross-section of the type of responses given:

"Sources and levels of emissions; regulations; control orders; compliance status; cost of pollution abatement; hazardous wastes; spills".

"Compliance deficiencies; recommendations to improve; future considerations".

"Comprehensive - soup to nuts".

"Factual findings, positive and negative; recommendations for action; summary of audit procedure".

"Out of code areas; potential problems".

"Summary for upper management; detailed for plant".

"Balanced view of environmental performance".

5.5.5 Audit Protection

Questions 43 and 44 were designed to determine how audit information is protected within the company. They were asked this because the confidentiality of audit results has become a serious issue in the United States.[1]

---

[1] There are concerns that audit results could be legally obtained by third parties and ultimately used against the corporation. Consequently, some companies feel the need to protect the audit program through the "Attorney-Client privilege" or "Work-Product Doctrine". For a further discussion, see: Reed, John W. 1983; Weiss, Malcolm, 1984; or Reed, Philip D., 1983.

Table 5.5.5 presents the results of these two questions.

TABLE 5.5.5 - LEGAL SAFEGUARDS

Question 43: "Are audit results considered to be sensitive proprietary information?"		Question 44: "Has your company taken legal safeguards to protect audit results from third party discovery? (for example, solicitor-client privilege) If yes, please specify".	
YES	NO	YES	NO
18 (90%)	2 (10%)	2 (11%)	17 (89%)

As this table reveals, of the 20 respondents who completed Question 43, 18 (90%) felt that the information contained in audit reports was of a sensitive and proprietary nature. However, only 11% of the respondents invoked available legal safeguards to protect this information; 89% did not. Of the two who did, the "solicitor-client" privilege was not claimed: Reports were simply designated as "confidential".

These findings are consistent with experience in the United States private sector. There, despite warnings by the legal profession, the majority of companies have not gone through the necessary procedures to invoke the attorney-client or work product doctrine privileges. The confidentiality of audit results is treated as a non-issue.

5.5.6 Formal Response

Table 5.5.6 presents the results of Question 45.

TABLE 5.5.6 - FOLLOW-UP

Question 45: "Does your company have a formal procedure for responding to the final audit report?" If so, who responds, and how long after receiving the report?"

NO	YES	WHO?	HOW LONG?
11 (55%)	9 (45%)	Plant Management (75%)	1 month to 2 months (average)

This table reveals that eleven of 20 respondents (55%) reported that they do not have a formal procedure in place for responding to audit reports. (This does not preclude the presence of various informal means of following up on audit reports.) Of the nine companies who do, plant or line management responds to the report 75% of the time. Others who responded to the report include "Central Plant Engineering" and "Environmental Control Coordinator". The majority of firms in the Chemical industry do have formal response procedures.

The length of time between the presentation of and subsequent response to results varies from one to two months.

During personal interviews it was learned that many firms conduct "exit interviews" and present the audit findings (on a preliminary basis) to plant managers before leaving the site, providing an opportunity for early feedback and response. Though a positive feature, this is not the same thing as formal, post-audit response.

5.5.7 Corrective Actions

The results of Question 46 are found in Table 5.5.7.

TABLE 5.5.7 - CORRECTIVE MEASURES

Question 46: "Who designs corrective measures ("action plans") for deficiencies or problems identified by the audit? If not the audit manager/team, does the manager/team require the submission of proposed corrective measures for its review and/or approval?"

A Audit Manager/ Team	B Plant Management	C Combination of Both	If B or C, YES	If B or C, NO
1 (5%)	8 (42%)	10 (53%)	5 (28%)	12 (67%)

As Table 5.5.7 illustrates, only in one company does the audit manager/team alone design corrective measures, although many make recommendations for improvement. Plant managers design action plans in eight of the companies (42%) and a combination of both audit manager/team and plant managers share this responsibility in the remaining ten firms. Of those in the latter two categories, twelve companies (67%) do not submit proposed action plans to the audit manager/team for their review and/or approval; five companies (28%) do.

Since responsibility for environmental control is normally at the plant level, it is not surprising that plant management would be largely responsible for the design of corrective actions. Moreover, most environmental audit managers/teams do not want to be viewed as telling plant managers how to do their job. This point in particular was raised on several occasions during personal interviews.

5.5.8 Feedback

Table 5.5.8 summarizes the responses to Question 47.

TABLE 5.5.8 - FEEDBACK

Question 47: "Does the audit manager/team perform routine checks to determine whether identified deficiencies have been corrected? If so, how often? If not, does the audit manager/team require that plant management submit "progress reports" regarding corrective action?"

		IF NO	
YES	NO	YES	NO
12 (60%)	8 (40%)	1 (13%)	6 (75%)

As this table demonstrates, twelve of 20 respondents (60%) report that they do perform routine checks to determine progress on correcting identified deficiencies. Again, the Chemical industry is a leader in this regard. Of the eight companies who do not perform routine checks, six of them (75%) do not require the submission of progress reports; either only one company does.

These figures are not impressive, particularly when coupled with the fact that eleven firms (55% of those with auditing programs) do not have formal response procedures (from Table 5.5.6). In fact, of those eleven firms, six (55%) do not perform routine checks nor require progress reports (from Table 5.5.7). This means that a full 30% of firms with auditing programs in Canada do not have any formal procedures for follow-up or feedback. This includes firms from all industrial sectors.

This is disturbing. Follow-up and feedback procedures are the cornerstone of effective environmental auditing programs. The absence of such procedures constitute a significant flaw in some programs. With that said, it should be re-emphasized that the lack of formal follow-up and feedback procedures does not preclude the existence of informal means of following up on audit results. It was learned in personal interviews that several firms without formal follow-up procedures do have effective informal follow-up procedures.

Some general comments received during the investigation include:

"Confidence in the environmental audit system is a function of the reports to corporate people".

"Environmental auditing is more than just the checklist: It must include provisions for reporting, responsibility and accountability".

"Environmental auditing itself is not the answer. If don't do anything [correct identified deficiencies] — one strike against. If act on it — one strike in favour".

5.6 AUDIT BENEFITS

5.6.1 Evaluation Criteria

Question 48: "How is the success of your audit program evaluated?"

This open-ended question was intended to determine some of the criteria companies use to evaluate the success of their environmental auditing programs. Unfortunately, several respondents interpreted the question to mean "What is the success of your program?" and gave responses like "good", "excellent", and "to early to tell".

Of those that interpreted it in the intended manner came responses such as:

"When deficiencies are corrected".

"Degree of compliance with regulations and policies; cases of non-compliance".

"Client feedback on report".

"By the reaction of plant personnel and senior Vice-President".

"Response to recommendation and compliance record of facility".

"Achievement of objectives; useful working document for plant".

"Good question!"

"According to: Number of deficiencies identified/ corrected; reduction of degree of risk; improvements to status of compliance".

"By an outside consulting firm".

From these responses, it can be seen that many companies attempt to evaluate success by measurable criteria such as improved compliance or the correction of problems. A significant number also rely on the subjective feedback of relevant personnel.

The responses also suggest that while environmental auditing program's produce sizable benefits of an intangible, unquantifiable nature (such as improved communication, employee awareness and concern, public image, etc.), program success will be evaluated according to measurable criteria. Such measures, though easily digested and demonstrated, tell only half the story.

5.6.2 Cost-savings

Question 49: "Have your audits identified areas for potential cost savings? If yes, what?"

The majority of respondents to this question (53%) reported that their audits have identified areas for potential cost savings. Forty-two percent answered "no" and one respondent was "not sure".

Those who answered in the affirmative identified specific examples such as:

"Recovery of recyclable materials and energy in waste elements".

"Changes to operational practices".

"Waste recovery and recycling".

"Future liabilities".

"Sharing information on methods".

"Reduction of risk potential relative to fines and/or lawsuits".

The comments revealed that most cost-savings were a function of material recycling, recovery, loss prevention and the like. However, some areas of cost-savings -- such as "future liabilities" and "information sharing" -- were of an intangible nature. These "intangible" and "potential" areas of cost savings, though not necessarily measurable, are nevertheless a major contributor to the overall benefit of environmental auditing programs.

5.6.3 Other Benefits

Question 50: "What indirect or unintended benefits did your audit program result in?"

Responses to this question varied widely. Many companies answered with "none" or "too early to tell". The more interesting responses included:

"Educational value".

"Sensitization of upper management".

"Better communication, better general understanding of management needs, more management awareness".

"Attitude, interest, improved management structure".

"Better maintenance and housekeeping".

"Brings message of company policy to line management in a strong way".

5.6.4 Compliance Record

Question 51: "In your opinion, does environmental auditing result in improved compliance with environmental regulations?"

Of the 20 respondents who completed this question, 25% answered "probably" and the remaining 75% answered "yes". That proponents of environmental auditing would believe that auditing leads to improved compliance is not surprising. It would be interesting to determine whether, in fact, environmental auditing in these firms resulted in improved compliance 100% of the time. If it did, it would signal tremendous commitment on the part of the proponent firm.

One company observed (after responding "yes"),
"Always. That's why we do them in the first place!"

5.7 SUMMARY

There is a strong consistency in the generic approach with which individual Canadian firms conduct environmental auditing programs. Each company follows the same general pattern of audit organization, pre-audit preparation, on-site investigation, audit reporting and follow up. Yet within this broad framework, there is considerable allowance for variation and individualism. For example, who staffs the program, which techniques are used, who goes on-site, who designs corrective measures and how follow up occurs are all individual options which can be chosen to meet the unique needs of individual firms.

There is also considerable similarity between Canadian and U.S. programs in terms of the generic method. There are of course some differences. In Canada, there seems to be a greater emphasis on assessing facility management than on assuring corporate management. The reverse seems to be true in the United States. Also, many programs in the United States focus predominantly and understandably, on compliance with environmental regulations. In contrast, many Canadian programs examine much more than just compliance with regulations, and look at management practices and other activities that affect environmental control.

6.0 CHARACTERISTICS OF PLANNED PROGRAMS

Respondents who reported that they intend to institute an environmental auditing program were directed to complete Questions 7-17 regarding the characteristics of planned environmental auditing programs, including their responsibility, objectives, scope, staffing, methods, reporting and follow-up.

In total, six companies reported that they intend to develop environmental auditing programs — three from the Chemical industry, two from Petroleum and one from Steelmaking. As in Chapter Five, a sector by sector analysis will not be performed here. Differences in approach to auditing between sectors will be noted when they are significant enough to warrant.

6.1 RESPONSIBILITY

Question 7: "Where will responsibility for the program lie?" (What department, division)

6.1.1 Department

Four of the six programs were to be housed in departments specifically created to address environmental concerns of the company. These included "Environmental Control", "Environmental Protection", and "Health Safety and Environmental Affairs" Departments. One program was to be housed in the "Corporate Technical Department". One company reported that responsibility would be at "Each Manufacturing Site".

6.1.2 Level

Three companies reported the level of responsibility for their auditing programs. Each of "Corporate Head Office", "Division", and "plant" level were identified.

6.2 OBJECTIVES

Question 8: "What are the principle objectives of the program?

As in those of existing programs, the objectives for planned environmental auditing programs appear to vary widely. These are identified in Table 6.2. They appear in an order reflecting the number of times they were identified and are not ranked according to importance.

TABLE 6.2 — INTENDED PROGRAM OBJECTIVES

- Compliance with environmental regulations
- Compliance with company policies
- Improve environmental performance
- Aid in expenditure planning
- Identify current and potential problem areas for preparation of action plans
- Protect the environment
- Develop environmental information system
- Protect against liability
- Enable sharing of information and solutions
- Improve level of awareness
- Evaluate environmental conditions at plants

As Table 6.2 reveals, there is a strong emphasis on measuring or verifying compliance with environmental regulations and company policies. This is particularly so in the Chemical industry, where all three respondents reported this objective. One company in particular put a strong emphasis on using environmental auditing as an education and communication tool, identifying both the ninth and tenth objectives listed above as its program objectives.

6.3 SCOPE — AREAS OF REVIEW

Question 9: "Which of the following will be audited at each operating facility?"

Table 6.3 below lists the options given in Question 9 as well as the percentage of respondents who selected each option.

TABLE 6.3 — SCOPE - AREAS OF REVIEW

	Area of Review	Response
A.	Regulations/Permits for air emissions	100%
B.	Regulations/Permits for water discharges	100%
C.	Regulations/Permits for land discharges	100%
D.	Regulations/Permits for waste disposal	100%
E.	Regulations/Permits for transportation	67%
F.	Corporate or plant environmental policies	100%
G.	Monitoring procedures and practices within the company	100%
H.	Reporting procedures and practices within the company	100%
I.	Reporting and notification of external authorities	83%
J.	Monitoring and sampling devices	100%
K.	Operating units	83%
L.	Environmental emergency response	33%
M.	Worker safety	--
N.	Worker health	--
O.	Loss prevention	--
P.	Filing systems	67%
Q.	Routine maintenance	33%

As this table illustrates, there is strong support for all items listed, particularly regulations/permits. Noteworthy exceptions include "environmental emergency response", "worker safety", "worker health", "loss prevention", and "routine maintenance". Two companies, both in the Chemical industry, indicated that worker safety and worker health concerns were addressed by other internal audit programs. One other area identified by a respondent was "Environmental Control plans".

6.4 STAFFING

There were three questions related to staffing.

Question 10: "Will outside consultants have a role with respect to your environmental auditing program?"

Five of six respondents reported that consultants would not be playing a role in the audit program. This reflects a desire to internalize the auditing function and to build in-house expertise. The remaining company responded,

> "Possibly. The manpower and expertise requirements have yet to be finalized".

Question 11: "Will the environmental auditing program be conducted by an individual or a team?"

Interestingly, a full 100% of respondents reported that a team would be conducting the program.

Question 12: "What departments will be represented?"

From the four companies who completed Question 12, the following departments were identified: "Environmental Control", "Production", "Health, Safety and Environmental Affairs", "Maintenance", "Engineering", "Utilities" and "Corporate Management". Three of the four companies specifically identified a corporate department as being represented on the team. One company plans to use a "Canadian plant person" on the team; one will use personnel from various operating sections of the facility.

6.5 GATHERING AUDIT INFORMATION

Question 13: "Will an on-site investigation of "audited" facilities be conducted?"

All six respondents answered "yes" to this question.

Question 14: "Will the audited facility be notified prior to the on-site investigation?"

Five of six respondents reported that targeted facilities would be notified prior to the on-site visit. The other was "not sure". This is consistent with the findings of those companies with existing programs.

The options given in this question and the responses of the five companies who completed it are given in Table 6.5.

TABLE 6.5 — ON-SITE METHODS

Question 15:
"What methods, techniques and/or aids will be used to gather audit information on-site?"

Method		Level of Use
A.	Checklists	100%
B.	Questionnaires	100%
C.	Physical Inspection of Facilities	100%
D.	Observation of Daily Practices	80%
E.	Interview Plant Personnel	100%
F.	External Laboratory Testing	--
G.	Cameras	60%

As this table reveals, interviews, inspection and checklists/questionnaires receive equal emphasis as methods of collecting information. Note that no companies plan to use external laboratory testing as a method of documenting information.

6.6 REPORTING

Question 16: "Will audit results be presented orally or in a written report?"

Of the five companies who responded to this question, four plan to present audit results in both forms — written and orally. One will use a written report only.

6.7 FOLLOW-UP

Question 17: "Will there be a formal procedure for follow-up on audit results?"

Two of the six respondents to this question were "not sure" whether there would be formal follow-up. The other four responded "yes". From them came the following comments:

> "Written response by plant supervision with times/ dates for action".
>
> "All appropriate personnel will meet to discuss findings, future action schedule .

It is difficult to determine from this brief question whether these reported follow-up procedures would be effective and whether there is a strong commitment to correct identified deficiencies.

6.8 SUMMARY

It appears as though the characteristics of planned programs coincide very closely with those of existing programs. This confirms earlier findings that there is a strong consistency in generic approach to conducting audits.

While the survey only documented six planned programs, personal interviews revealed that several other companies are moving towards establishing a formal environmental auditing program. Having said that, many other companies were not convinced of the need for or usefulness of environmental auditing programs. Its future is by no means guaranteed.

7.0 EVALUATION OF ENVIRONMENTAL AUDITING

7.1 INTRODUCTION

Environmental auditing is an internal management tool developed and used by private firms for their own benefit. However, it has the potential to produce public benefits. It can serve to promote environmental awareness within a firm and ultimately to increase the level of environmental protection offered by it.

Any private practice that has potential to impact upon the public domain must be evaluated in terms of its actual effects -- both positive and negative. To this end, this chapter will evaluate environmental auditing as means of promoting and increasing environmental protection, raising questions and exposing relevant issues. This will be accomplished by examining two extreme positions. The optimistic viewpoint would hold that environmental auditing will result in increased environmental protection. While this does not necessarily mean that every single company's program will have this effect, or that each individual audit will either, it does mean that the net effect of environmental auditing will be positive. This is so with or without government intervention. The pessimistic or cynical viewpoint would hold that environmental auditing will be manipulated and abused by private firms to gain private benefit without producing public benefit, or worse still, while producing public injury or disbenefit. The concerns underlying the cynical viewpoint are twofold: That auditing will lead to reduced or compromised environmental protection; and that industry will receive unwarranted public recognition and endorsement. In both cases, the net effect of environmental auditing would be negative.

Before continuing, certain concepts need to be defined. In the context of environmental auditing and private sector environmental management, evidence of private sector efforts toward <u>environmental protection</u> might include:

* compliance with existing environmental regulations, permits and company policies
* management of regulated <u>and</u> unregulated hazards

* institution of environmental emergency preparation and response procedures.

Environmental protection includes both current (actual) and future (potential) dimensions.

Increased environmental protection could be measured by a reduction in the total number, severity and/or frequency on non-compliance incidents, by the improved identification and management of environmental hazards, or by better preparation and response capabilities for environmental emergencies. Promotion of environmental protection could be measured by increased employee awareness of company policies, operating procedures and responsibilities, of control technologies, and of general environmental concerns.

Public injury or disbenefit could be measured by decreased compliance with regulations and permits, poorer management of environmental hazards, poorer preparation and response capability for emergency situations, or by public recognition and endorsement for private auditing efforts without corresponding public benefit. An auditing activity which resulted in neither public benefit nor harm is not considered to be a public disbenefit.

There seems no doubt that the potential for private firms to abuse environmental auditing, and thereby produce public disbenefits, exists. But the more important question is not can firms abuse auditing, but, rather, will they abuse it? This question will be examined from the perspectives of the public at large, the government, and private industry.

Many of the arguments that follow are subjective in nature, and are therefore open to challenge. Support for or against a given position is based on the assumptions and beliefs one has regarding the motivation and behaviour of private industry, the public, and the government. In addition, comparative reference will also be made to the experiences with

---

[1] For the purposes of this Chapter, the author's assumptions and beliefs have been conditioned by extensive interviews with industry, legal, government, and academic personnel.

safety auditing and environmental impact assessment. Although there are significant differences between environmental auditing and these two practices, they may nevertheless offer lessons useful in evaluating the potential of environmental auditing as a means of promoting and increasing environmental protection. Safety auditing was chosen because procedurally and functionally it is very similar to environmental auditing: Also used as a routine component of corporate management, it was developed and applied for many of the same generic reasons as environmental auditing. Environmental impact assessment is a planning tool that is neither functionally nor procedurally similar to environmental auditing. However, in substance -- environmental information -- it does resemble environmental auditing. Furthermore, it is an environmental protection tool whose unrealized potential illustrates the discrepancy between theory and practice in the environmental field.

Before discussion commences, it is necessary to distinguish between two "user" scenarios. In the first, industry uses environmental auditing solely as an internal routine management practice. There is no government intervention or involvement. This is the current state of affairs in Canada. In the second, there is direct government intervention. Such intervention could take several forms, including for example, the public recognition and endorsement of private auditing efforts, the inducing of firms to adopt environmental auditing procedures by offering certain "rewards" or "incentives", or the legal mandating of environmental auditing as a regulatory tool. These user scenarios affect the evaluation of environmental auditing profoundly, and will therefore be discussed separately.

7.2 THE PUBLIC AT LARGE

For the purposes of this discussion, the public at large is interpreted broadly, encompassing the interests of the natural environment. Public welfare is in part directly related to the welfare of the natural environment. An increase in environmental protection, because it benefits the natural environment, also benefits the public at large.

The following are some assumptions the public at large makes regarding the behaviour and attitudes of private industry.

* Neither private industry nor the government are completely trustworthy, raising questions of credibility, integrity and reliability[1]
* Private industry will sacrifice the environment -- intentionally or not - in pursuit of profit objectives. It will subvert the public and government for self-gain.
* Private industry, and to a lesser degree the government, are responsible for today's environmental condition
* Incentives to comply with regulations are small - the chances of getting caught, and the fines when caught, are quite small.[2]

Given this set of assumptions, the public at large can be expected to view environmental auditing with skepticism. One of the chief concerns will likely be with accountability. The public will want assurance that private industries conduct themselves responsibly and use environmental auditing in a positive manner, and that the government will detect and hold publicly accountable those that do not. This concern stems from the belief that some private firms will misuse and subvert environmental auditing for their own gain, at the expense of the public (and environmental) good. A company could, for example, discover that it is spending more than necessary to meet the letter of the law, and therefore cut back on non-essential practices. It could identify actual and potential environmental hazards and attempt to cover them up or to shift the blame. It could establish superficial and ineffective programs solely to qualify for government programs and gain the public relations value of government endorsement.

Public fear is not without foundation. Some industry behaviour in the past has been shameful. There are numerous examples of industrial practices that have led to environmental catastrophes and the pollution of

---

1 Based on personal interviews

2 Peat Marwick and Partners, 1983.

air, water and land. In some instances, industry has knowingly and deliberately damaged the environment. Given this, is there any reason to believe that things have changed? Even today, many companies are out of compliance with existing environmental regulations. It is, in some cases, cheaper to pollute than comply.[1] Can private industry be trusted to use environmental auditing in a positive manner? Most important, how do we safeguard against potential misuse? Does the government have the ability and resources to address a program of environmental auditing -- they seem unable or unwilling to enforce simple compliance as it is?!

Experience with environmental impact assessment provides an example of how a recent environmental protection tool was abused by private industry. In the article "The Environmental Impact Statement vs. The Real World" the authors, Bardach and Pugliaresi (1977), charge that EIS's produced by private proponents were only superficial in analysis -- the EIS mandate prevented a "hard look" at environmental issues, that impact studies were too long, redundant and irrelevant, and that the concentration was on trivial issues. In brief, the authors charge that EIS's were rendered ineffective decision-making tools. And they attribute this sorry state of affairs to one key factor: proponents were made publicly accountable for their actions and, quite naturally, adopted a defensive position — they produced EIS's that were all-encompassing. No detail, however small, was left out. The result? Impact assessment became a tool to defend or justify industry's initiatives rather than a tool to critically assess potential impacts and identify actions needed to improve current practice.

Environmental auditing could be open to the same misuse, especially if firms are pushed into adopting a defensive posture -- if they are made completely publicly accountable for their "mistakes". Therein lies the dilemma: If they are not made accountable, can they be trusted to make proper use of environmental audits? If they are made accountable, will they simply use environmental auditing as a means of defending themselves? Either way there is potential for misuse.

---

[1] In a report titled "Economic Incentive Policy Instrument to Implement Pollution Control Objectives in Ontario", Peat Marwick and Associates determined that the costs of compliance usually far exceed the costs of non-compliance. It is simply cheaper to pollute.

In the first user scenario, if environmental audit reports were superficial, redundant, long and generally ineffective, the firm would simply have wasted its time and money. There would be neither public benefit nor harm. On the other hand, if a firm were to receive some government reward for an ineffective and superficial auditing program, then there would be public harm. The implications of this are obvious: any formal government initiative would have to have built-in safeguards or "tests" for eligibility, adequacy and effectiveness.

Environmental impact assessment has had some positive impacts. It has served to heighten the importance of environmental considerations in decision-making processes and to raise the general level of awareness of environmental concerns. Environmental auditing may have the same effect: It could lead to an increased employee awareness of environmental protection and a better understanding of responsibilities and practices in the environmental area. Such increased awareness could prove to be of direct value, for example, in the event of an emergency situation.

7.3 PRIVATE INDUSTRY

Whether one views environmental auditing with optimism or pessimism depends largely on the assumptions one makes about industry behaviour and motivation. From an industry standpoint, the following assumptions may apply.

* Industry will always act in its own best interest. Given proper incentives, such as potential fines, penalties, third party liabilities, clean-up costs and adverse publicity, -- incentives which have been increasing in the last ten years -- the proper and responsible management of environmental activities is in the best interest of a company.[1]
* Corporate attitude towards environmental protection has shifted. The conventional wisdoms about private industry behaviour regarding environment no longer apply[2], although

---

1 Based on personal interviews

2 Dickson Thompson, 1982, p.8

there are still some exceptions to the above - "bad apples" so to speak.

* Upper management will not sanction deceit, lies or poor performance.[1]

Given these assumptions the question must be asked, will they abuse environmental auditing?

The potential for firms to attempt to gain unearned publicity and positive public relations is real, particularly under the second user scenario. With direct government intervention and reward, there is a greater incentive and opportunity for firms to attempt to capture public recognition without fulfilling their reciprocal obligation of addressing environmental protection in a positive manner. This is acutely so under a voluntary system whereby "bad actors" may see an opportunity to cash in on the coattails of the "good actors".

Two questions must be asked. "What are the realistic gains of this activity?" Experience with safety auditing suggests that the public will not attribute much public relations value to environmental auditing -- they will view it as an activity that responsible firms should be doing anyway and, should have been doing long ago.[1] Second, "are the potential gains worth the potential losses"? The potential gains of abuse have already been discussed; they include cost savings and favourable (but unearned) publicity. These must be weighed against the potential losses of getting caught abusing environmental auditing -- the threat of increased fines, third party liabilities and adverse publicity. It is one thing to be out of compliance, but quite another to develop a program specifically created to lie about it. Is the gamble in the best interest of the company? Besides, if it was a company's intent to be a "bad actor" from the outset, would it go to the time and expense required to develop an auditing program? Wouldn't it be cheaper just to maintain the status quo?

---

[1] Based on personal interviews.

Whether there is a need for additional safeguards for ensuring program credibility and accountability is debatable. Environmental auditing is a means of conducting business. Industry would argue that the public, and the government, should not be concerned with means but with ends -- what comes out the pipe. The measure of program effectiveness -- that is, its effect on environmental protection -- can be determined by conventional end-of-pipe measurements.

7.4 GOVERNMENT

The government and the public at large share many concerns over the private use of environmental auditing. The government too is concerned with the integrity, accountability and potential abuse of private auditing programs: Will auditing lead to public benefits? In addition, the government (and the public at large) is concerned with how best to maximize the benefits to the public and minimize the injury to the public. What, if any, is the most appropriate form of government intervention?

The United States Environment Protection Agency, as well as numerous state level environmental agencies, believe that the private use of environmental auditing will lead to increased environmental protection, as measured by improved compliance with regulations, better risk management and increased employee awareness. They have said this in writing and in action.[1] Several jurisdictions are now publicly encouraging, supporting and/or endorsing private auditing efforts. One state has taken steps to mandate environmental auditing.[2]

Experience with safety auditing may be a source of their optimism.[3] Its practice has lead to better understanding of and compliance

---

1 See for example: E.P.A., 1982.

2 The state of New Mexico -- see The Environmental Audit Letter, May/June, 1984.

3 The development of safety auditing was both internally and externally motivated. As with environmental auditing, the need for safety auditing was created out of external government regulations, public relations, insurance, etc. In addition, safety auditing had the internal support of labour unions, who viewed it as a natural part of a larger labour reform working towards improved workplace conditions.

with health and safety regulations, more employee concern and, overall healthier and safer workplace conditions. Regulators and enforcement agencies view safety auditing as a positive means of enhancing Internal Responsibility Systems.[1] It is not unreasonable to expect auditing in the environmental area to yield the same results.

Believing that environmental auditing can result in public benefits, and developing government programs to maximize those benefits, are entirely separate issues. The policy, design and implementation issues underlying such programs are complex. For example, should the program be voluntary or mandatory? Under a voluntary program for example, the following would have to be addressed:

* What can the government do to encourage firms to adopt environmental auditing programs? Decreased fines? Decreased reporting requirements? Grants? Tax incentives? Public endorsement?
* What are the data requirements - what is required of firms in exchange for "rewards"?
* How to reach the "bad actors"? -- good ones will already be auditing?
* How to reach small companies (with fewer resources)?
* How to determine eligibility? How can the government be sure that "rewards" are earned? How to identify and ensure the integrity, credibility and effectiveness of private auditing programs?

The difficulties posed by a mandatory program are similar if not greater. In addition to those questions raised above, a mandatory program necessitates that issues of equity, accountability, credibility and enforcement be addressed.

Government intervention may create two classes of users. The first are those that would have used and are using environmental auditing as an internal management practice with or without government intervention. The second are the ones who are motivated to establish

---

[1] Based on personal interviews.

auditing programs only with direct government incentives -- either voluntary or mandatory. It is perhaps within this second group that the stimulation and potential for abuse is greatest.

7.5 AN INDUSTRY REJOINDER

The reasons for public skepticism of industry's use of environmental auditing are well founded. In light of these, what evidence is there to suggest that private industry's attitude towards the environment has shifted for the better and that it will use environmental auditing in a positive manner? Are there any signals?

One signal flows from the increasing realization by corporations that acting in an environmentally responsible manner is in the firm's best interest. Many major firms today have formal corporate policies addressing environmental concerns.[1] Though they range in the degree of specificity, these policies generally commit the firm to protect the environment and employ best control technologies. As little as ten years ago, many firms did not have such a policy in place.[2] While one can always identify "bad apples" in a crowd and identify companies with poor environmental records, there are many companies exhibiting a real concern for the environment through good, solid environmental programs. To deny this is to live in the past.

Corporate activity in other areas also provides signals. There was a time, for example, when product safety, worker health and worker safety were not of paramount corporate concern. Companies have now acknowledged their responsibilities in these areas and have developed appropriate policies and programs to address them. Is it unreasonable to expect the same to occur in the environmental protection field? The manner in which environmental auditing was developed and used suggests that this is already occurring. Unlike environmental impact assessment,

---

1 Based on personal interviews.

2 Industry would also argue that current examples of environmental degradation are not the result of malicious past behaviour. At the time, industry was acting in a lawful, acceptable and encouraged manner. Neither industry nor government knew what the consequences of their actions would be.

environmental auditing was not developed and applied by the government to control industrial activity. Rather, it was developed and used by industry long before governments became interested and involved. Its value was seen as being internal -- it was a tool to help a firm manage itself better.

Also, private industry has not been the most vocal proponent of environmental auditing. Governments, consultants and lawyers have. The public only knows of several programs because the government told them. Many of these were "discovered" only after direct government inquiry. If indeed private industry is out to abuse environmental auditing.

7.6 A VERDICT?

The foregoing discussion demonstrates that whether one is optimistic or pessimistic about the future of environmental auditing depends largely on one's assumptions regarding the motivation and behaviour of private industry. In as much as these are based on differing value sets, there can be no definitive, empirical resolution to the questions regarding the future of environmental auditing and its ultimate effect. It cannot be said unequivocally that it will be positive or negative.

A shift in industrial attitude, experience with safety auditing, and the history of environmental auditing suggest that responsible ("good") firms will develop audit systems and will use them to promote and increase environmental protection. Notwithstanding that, the potential for firms to abuse environmental auditing is very real. Past industrial practices and experiences with environmental impact assessment suggest that the opportunity may be exploited by irresponsible firms. But that shouldn't detract from the value of environmental auditing as an environmental protection tool. The key question is, will the gains from positive users outweigh the potential losses from negative users?

Questions regarding the necessity for and the form of government intervention are equally difficult to resolve. It is not the intent of this paper to explore and evaluate these options. These are the topics of entire studies of their own. There can be no doubt that certain

government initiatives could produce public benefits and could aid regulators and enforcement agencies in the effective discharge of their responsibilities. Whether these would be the most effective means of achieving desired compliance objectives needs to be assessed.

7.7 UNEXPLORED APPLICATIONS

As has been stated throughout this paper, the concept of internal auditing is not new, though its practice in the environmental control field perhaps is. It is, therefore, not difficult to envision other applications and other users.

This paper has been geared largely to organizations which fit the model of a private firm -- that is, an organization with a given number of operating facilities. These included Petroleum, Chemical, Pulp and Paper, Utility, Steel, Waste Management and a host of other types of manufacturing industries. But the use of environmental auditing is not limited to these industries, or indeed, to private industry at all. This was demonstrated by the United States National Institutes of Health (N.I.H.). The N.I.H., a large biomedical research facility comprised of a complex set of facilities and operations, is examining the feasibility of using an environmental auditing program to identify what activities, materials, facilities, processes, and operations are subject to, pose a threat to, or appear to affect the environment in any manner as defined by government regulation.[1] The U.S. Department of Energy and the U.S. Air Force offer two other examples of non-conventional users. Conceivably, the environmental auditing framework can be used by any organization which has "operations" that affect the environment. An audit program in universities, hospitals, research laboratories, and so forth would not seem unreasonable.

Some potential uses of environmental auditing by regulators has already been discussed.[2] In addition to these, certain regulators have

---

[1] Unreleased Contract Scope of Work for N.I.H. Environmental Auditing Program.

[2] See also, Reed, John, 1982. "Environmental Auditing: A Review of Current Practice". York University.

raised the possibility of using the auditing framework as a means to profile and inventory entire industrial sectors with respect to compliance with regulations, control technologies and general management systems.[1] Combining industry submitted data with beefed up inspections, regulators and enforcement personnel could use the information to better apply enforcement resources and to compare the performance of one sector to another. Legislators could use the information to develop regulations where they are needed most. There have also been suggestions that regulators and enforcers be "audited" themselves, in an attempt to determine their record with respect to inspections, detection of non-compliance incidents, enforcement actions, and prosecutions.

There have been suggestions that third party auditing be used as a means of resolving conflicts. For example, in situations involving a conflict between local industries, local residents and the environmental agencies, especially where there is distrust of government and industry alike by the public, a third party audit could provide a means of producing an objective and credible assessment or status profile of the activities, past and present, of each of the parties.

Perhaps one of the most interesting applications of environmental auditing would be as a monitoring and management tool during the construction of development projects. Considerable environmental damage often occurs during the construction phases of these projects and a series of audits applied during the pre- mid- and post-construction stages could go a long way to reducing these impacts. Among other things, this would provide a means of measuring compliance with mitigative measures and practices proposed in an Environmental Impact Statement. Did the firm do everything to reduce the impact it said it was going to?

---

[1] Based on personal interviews.

7.8 SUMMARY

The foregoing discussion illustrates that environmental auditing has applications beyond Canadian private sector industries. These examples were not intended to be exhaustive, only to demonstrate its potential. As the concept receives more exposure, other innovative applications will surely follow.

Under both user scenarios, private abuse of environmental auditing can be minimized through continued and stepped up government inspection and enforcement activities. Regardless of the means used to ensure compliance, if a firm is not in compliance, this can be detected through conventional end-of-the-pipe measurements. A company's compliance record should be a fundamental criterion for eligibility for direct government incentives, public endorsement, or, indeed, favourable publicity.

CONCLUSION

Underlying the conception of this project was the hope that it would promote the development and application of environmental auditing in Canada. Early into this investigation however, it became apparent that environmental auditing was doing quite well on its own; in many circles, it needed no introduction. The survey of Canadian industry, for example, revealed that a majority of respondents had heard of environmental auditing before, that over a quarter of the respondents currently conduct an environmental auditing program, that most think there is a need for internal environmental auditing procedures and that most of them think other firms should be encouraged to develop such procedures.

There is a strong similarity in the generic method used by United States and Canadian firms to conduct environmental auditing programs. Yet, Canadian auditing programs have shown themselves to be unique: They are not carbon copies of United States programs. There are differences in the underlying objectives and driving forces of private auditing programs in Canada. Canadian programs put a greater emphasis on assisting facility management and involving line personnel than do U.S. programs. Environmental auditing is seen to be more than just a tool to keep top managers out of jail. There are also differences in scope. Many United States private sector programs focus their audits strictly on compliance with existing regulations. Due to less rigorous and far-reaching environmental regulations and guidelines in Canada, many Canadian private sector programs look beyond strict compliance and examine the other unregulated activities that nevertheless affect environmental control. These include for example, employee awareness and training, emergency response, internal organization, and general housekeeping.

Within Canada, there is also a strong similarity in the general approach that firms take in conducting an environmental auditing program. Within that general framework, however, there is considerable room for individualization. Private programs will vary in their degrees of formality, structure and rigour, in their scope, staffing, organization and protocols, and in their underlying objectives.

Environmental auditing is still a young practice, particularly in Canada. There are many things yet to be learned and developed. Some of these will evolve from the trials and errors of individual companies; others from direct research. Perhaps one of the most urgent is the need to further develop and refine environmental auditing principles, methods, techniques and tools. Environmental auditing is as much a science as it is an art. Other issues, such as the confidentiality of audit reports, the relationship of environmental auditing to other company activities, and industry environmental auditing standards, also need to be addressed.

Finally, there is the issue of public accountability. It is not known how the Canadian public will react to private sector environmental auditing. There is likely to be a mix of reactions: Some good, some bad. The government has several options in the manner it responds to private sector environmental auditing, including no response at all. These options must be further examined by Canadian governments to determine their desirability, appropriateness and practicability. In the absence of a formal review of the kind necessary, this paper does not recommend any specific government program. At the very least, existing environmental laws must be maintained, or, better still, expanded, as should the efforts and resources spent by governments to measure, inspect, enforce and, when necessary, prosecute violators. Only under this type of regime will the need for auditing be nurtured.

It seems certain that in the short term, the use of environmental auditing will increase. The survey, and personal interviews, indicated that there is already momentum in that direction. For now there seems no practical way to prevent it -- this, despite the fact that auditing is vulnerable to abuse by irresponsible firms. But even if we could prevent more firms from developing internal environmental auditing programs, would we want to? Is not the potential for public benefit greater than the potential for public harm? I believe so, and, I believe, that's good for Canada.

APPENDICES

APPENDIX 1

List of Companies Questionnaire Sent To

Abitibi-Price Inc.
Acadia Forest Products Ltd.
Alberta Power Ltd.
Alcan Aluminum Limited
Algoma Steel Corp. Ltd.
Allied Chemical Canada Ltd.
Ault Foods Ltd.
BASF Canada Ltd.
B.C. Timber Ltd.
B.F. Goodrich Canada Inc.
Bate Chemical Co. Ltd.
Boise-Cascade Canada Ltd.
Borden Company Ltd.
Borg-Warner Chemicals Canada Ltd.
British Columbia Forest Products
Brook Bond Inc.
Burns Meats Ltd.
Canada Cement Lafarge Ltd.
Canada Packers Inc.
Canadian Forest Products Ltd.
Canadian General Electric Co. Ltd.
Carling O'Keefe Breweries of Canada
Carnation Inc.
Celanese Canada Inc.
Chrysler Canada Ltd.
Ciba-Geigy Canada Ltd.
C-I-L Inc.
CIP Inc.
Cominco Ltd.
Connors Bros. Ltd.
Consolidated-Bathurst Inc.
Cyanimid Canada Inc.
Denison Mines Limited

Digital Equipment of Canada
Dofasco Inc.
Dome Mines Ltd.
Domtar Inc.
Dow Chemical Canada Inc.
E.B. Eddy Forest Products Ltd.
Emery Industries Ltd.
Erco Industries Ltd.
Esso Petroleum Canada
Ethyl Canada Inc.
Falconbridge Limited
Firestone Canada Inc.
Ford Motor Company of Canada
Fraser Inc.
General Foods Ltd.
General Motors of Canada Ltd.
Gillette Canada Inc.
Goodyear Canada Inc.
Great Lakes Forest Products Inc.
Gulf Canada Ltd.
Hercules Canada Ltd.
Hiram Walker-Gooderham & Worts Ltd.
Honeywell Limited
Hudson Bay Mining & Smelting Co.
Husky Oil Operations Ltd.
IBM Canada Ltd.
Inco Limited
ITT Canada Ltd.
Kellogg Salada Canada Inc.
Kimberly-Clark of Canada Ltd.
Kodak Canada
Kraft Ltd.
John Labbatt Ltd.
Lake Ontario Cement Ltd.
LePages Limited
Lever Detergents Ltd.
MacMillan-Bloedel Ltd.

McCain Foods Limited
Molson Breweries Canada Ltd.
Monsanto Canada Inc.
Nacan Products Limited
National Sea Products Ltd.
New Brunswick Electric Power Commission
Newfoundland & Labrador Hydro-Electric Corp.
Noranda Mines Inc.
Northwood Pulp & Timber
Nova Scotia Power Corp.
Petro-Canada Ltd.
Petrosar Limited
Placer Development Limited
Polysar Limited
Postash Corp. of Saskatchewan
PPG Industries Canada Ltd.
Proctor & Gamble Inc.
Redpath Industries Ltd.
Reed Inc.
Reichold Limited
Rio Algom Limited
Rohm & Haas Canada Inc.
Rolland Inc.
Saskatchewan Power Corp.
Scott Paper Ltd.
Shell Canada Ltd.
Sherritt-Gordon Mines Ltd.
St. Lawrence Cement
St. Mary's Cement
Standard Industries Ltd.
Stelco Inc.
Suncor Inc.
Syncrude Canada Ltd.
Teck Corporation
Texaco Canada Inc.
The Ontario Paper Co. Ltd.
3M Canada Inc.

Ultramar Canada Inc.
Union Carbide Canada Ltd.
Uniroyal Ltd.
Westinghouse Canada Ltd.
Weston Bakeries Ltd.
Xerox Canada Inc.

APPENDIX 2

Survey Questionnaire

ENVIRONMENTAL AUDITING

An Investigation

Into Its Use

In Canada

GENERAL INSTRUCTIONS

Please read the enclosed description of environmental auditing.

Answer all questions appropriate to your company. These will be determined by your company's awareness and use of environmental auditing and are indicated by "GO TO" statements.

For each individual question, circle the letter, or in some cases letters, which correspond to your answer.

SECTION I

1. Have you heard of "environmental auditing" before? (Also called "environmental review", "environmental surveillance", "compliance monitoring")

   A. NO
   B. YES

   → (if A) GO TO QUESTION 5

2. Does your company currently conduct an "environmental auditing" program or similar procedures?

   A. NO
   B. YES

   → (if B) GO TO SECTION III, QUESTION 18 (PAGE 4)

3. Has your company considered implementing an "environmental auditing" program or similar procedures?

   A. NO
   B. YES

   → (if A) GO TO QUESTION 5

4. Does your company intend to institute an "environmental auditing" program or similar procedures?

   A. NO
   B. YES
   C. NOT SURE

   → (if B) GO TO SECTION II, QUESTION 7 (PAGE 2)

   → (if A) GO TO QUESTION 6

5. Do you think there is a need for environmental auditing or similar procedures at your company's operating facilities?

   A. NO
   B. YES
   C. NOT SURE

   → (if B) WHAT IS THIS NEED? _____

   _____

   _____

   GO TO QUESTION 54, PAGE 12

6. Indicate the reason (or reasons) why your company will not be instituting an "environmental auditing" program.

   A. TOO COSTLY
   B. NOT SUFFICIENT BENEFITS
   C. NO TIME
   D. NO NEED
   E. PRESENT ENVIRONMENTAL PERFORMANCE SATISFACTORY
   F. POTENTIAL FOR RELEASE OF CONFIDENTIAL INFORMATION
   G. POTENTIAL FOR IDENTIFICATION OF MAJOR PROBLEMS HAZARDS

   Please describe other reasons not listed _____

   _____

   GO TO QUESTION 53, PAGE 12

SECTION II

7. The following questions are aimed at those companies with environmental auditing programs in the design or pre-implementation stage. Even though program characteristics may not be finalized or approved, I would be interested in learning of your preliminary intentions regarding audit responsibility, objectives, scope, personnel and procedures.

   Where will responsibility for the program lie? (What department, division) _____

8. What are the principle objectives of the program?

   A. _____

   B. _____

   C. _____

   D. _____

9. Which of the following will be "audited" at each operating facility?

A. REGULATIONS/PERMITS FOR AIR EMISSIONS
B. REGULATIONS/PERMITS FOR WATER DISCHARGES
C. REGULATIONS/PERMITS FOR LAND DISCHARGES
D. REGULATIONS/PERMITS FOR WASTE DISPOSAL
E. REGULATIONS/PERMITS FOR TRANSPORTATION
F. CORPORATE/PLANT ENVIRONMENTAL POLICIES
G. MONITORING PROCEDURES AND PRACTICES
H. REPORTING PROCEDURES AND PRACTICES WITHIN THE COMPANY
I. REPORTING AND NOTIFICATION OF EXTERNAL AUTHORITIES
J. MONITORING AND SAMPLING DEVICES
K. OPERATING UNITS
L. ENVIRONMENTAL EMERGENCY RESPONSE
M. WORKER SAFETY
N. WORKER HEALTH
O. LOSS PREVENTION
P. FILING SYSTEMS
Q. ROUTINE MAINTENANCE

Please describe other areas not listed above _____

_____

10. Will outside consultants have a role with respect to your "environmental auditing" program?

A. NO
B. YES

→ (IF B) Describe briefly _____

_____

_____

11. Will the "environmental auditing program be conducted by an individual or a team?

A. INDIVIDUAL
B. TEAM

12. What department(s) will be represented?

_____

_____

13. Will an on-site investigation of "audited" facilities be conducted?

A. NO
B. YES

14. Will the "audited" facility be notified prior to the on-site investigation?

A. NO
B. YES

15. What methods, techniques and/or aids will be used to gather audit information on-site?

A. CHECKLISTS
B. QUESTIONNAIRES
C. PHYSICAL INSPECTION OF FACILITIES
D. OBSERVATION OF DAILY PRACTICES
E. INTERVIEW PLANT PERSONNEL
F. EXTERNAL LABORATORY TESTING
G. CAMERAS

Please describe other methods not listed above _____

_____

_____

16. Will audit results be presented orally or in a written report?

A. ORALLY
B. WRITTEN REPORT
C. BOTH

17. Will there be a formal procedure for follow-up on audit results?

A. NO
B. YES
C. NOT SURE

→ (if B) Describe briefly _____

_____

_____

GO TO QUESTION 52 (PAGE 11)

SECTION III

18. The following questions are intended to document the characteristics of existing "environmental auditing" programs/procedures. Because of the variation in individual companies programs, designing "all-inclusive" questions is difficult. Please use the "OTHER" category when listed responses fail to adequately or completely describe your program.

What is the programs title? _____

19. In what year was it established? _____

20. How many "audits" have been conducted to date? _____

21. Where does responsibility for the program lie? (What department, division) _____

22. What are the principle objectives of the program?

A. _____

B. _____

C. _____

D. _____

SCOPE

23. Which of the following are "audited" at each operating facility?

A. REGULATIONS/PERMITS FOR AIR EMISSIONS
B. REGULATIONS/PERMITS FOR WATER DISCHARGES
C. REGULATIONS/PERMITS FOR LAND DISCHARGES
D. REGULATIONS/PERMITS FOR WASTE DISPOSAL
E. REGULATIONS/PERMITS FOR TRANSPORTATION
F. CORPORATE OR PLANT ENVIRONMENTAL POLICIES
G. MONITORING REQUIREMENTS AND PRACTICES
H. REPORTING REQUIREMENTS AND PRACTICES WITHIN THE COMPANY
I. REPORTING AND NOTIFICATION TO EXTERNAL AUTHORITIES
J. MANAGEMENT SYSTEMS AND CONTROLS
K. OPERATING UNITS FOR POLLUTION CONTROL — ON-SITE
L. OPERATING UNITS FOR POLLUTION CONTROL — OFF-SITE
M. MONITORING/SAMPLING EQUIPMENT
N. EMPLOYEE TRAINING PROGRAMS
O. ENVIRONMENTAL EMERGENCY RESPONSE
P. WORKER SAFETY
Q. WORKER HEALTH
R. LOSS PREVENTION
S. COMPLAINT HANDLING
T. FILING SYSTEMS
U. LABORATORY TESTING EQUIPMENT AND PROTOCOLS
V. ROUTINE MAINTENANCE

Please describe other areas not listed above _____

_____

_____

24. Are all of your company's operating facilities "audited"?

A. NO
B. YES

→ (if A) Why not? _____

_____

_____

25. How frequently is each operating facility "audited"?

_____

PERSONNEL

26. Do outside consultants play a role with regards to your "environmental auditing" program?

A. NO
B. YES

→ (if A) GO TO QUESTION 27

→ (if B) What is this role?

A. TRAINING OF IN-HOUSE PERSONNEL
B. ASSIST IN DESIGN OF PROGRAM
C. CONDUCT OF "AUDITS"

Describe other roles not listed _____

_____

_____

Why were outside consultants selected to perform the role or roles listed above?

_____

_____

GO TO QUESTION 30

27. Is your "audit" program conducted by an individual or a team?

A. TEAM
B. INDIVIDUAL

→ (if B) What department or division does he/she represent? _____

→ (if A) How many team members? _____

For each team member, indicate the department or division represented and his/her status (that is, full-time or part-time) on next page.

DEPARTMENT/DIVISION REPRESENTED	STATUS

28. In addition to those departments listed in QUESTION 27 (above), which of the following had input into the design and/or conduct of your program?

A. INTERNAL FINANCIAL AUDITING
B. LEGAL
C. OCCUPATIONAL HEALTH
D. SAFETY
E. MANUFACTURING
F. TOXICOLOGY
G. TOP CORPORATE MANAGEMENT
H. OTHER OPERATING FACILITY PERSONNEL

Please list others not given above _____

29. Has the audit manager/team received formal training in (environmental) auditing techniques?

A. NO
B. YES

(if B) Who conducted this training? _____

GATHERING AUDIT INFORMATION

30. Is an on-site investigation conducted by the audit manager/team?

A. NO
B. YES

(if A) How is audit information gathered?

GO TO QUESTION 38 (PAGE 9)

31. How many team members conduct the on-site investigation?

32. How long does the on-site investigation usually take?

33. Is the "audited" facility notified prior to the on-site investigation?

A. NO
B. YES

(if B) How long before? _____

34. How does your audit manager/team prepare for the on-site investigation?

A. REVIEW OF PREVIOUS AUDIT/INSPECTION REPORTS
B. REVIEW OF REGULATIONS
C. REVIEW OF JOB DESCRIPTIONS, INTERNAL ORGANIZATION
D. REVIEW OF PROCESS FLOWS
E. PERSONAL OBSERVATION — ON-SITE VISIT AND TOUR
F. ADMINISTER 'PRE-VISIT' QUESTIONNAIRE
G. FORMAL BRIEFINGS, INTERVIEWS

Describe other methods not listed _____

35. Is the "audited" facility's management prepared for the on-site investigation by the audit manager/team?

A. NO
B. YES

(if B) How? _____

36. Are the "audit" procedures and overall process documented in a written manual?

A. NO
B. YES

37. Various methods, techniques and aids can be used to gather information on-site. Which of the following does your program use?

A. CHECKLISTS
B. QUESTIONNAIRE
C. PHYSICAL INSPECTION OF POLLUTION CONTROL EQUIPMENT AND DEVICES
D. PHYSICAL INSPECTION OF OPERATING UNITS
E. PHYSICAL INSPECTION OF PLANT RECORDS, REPORTS
F. OBSERVATION OF DAILY PRACTICES
G. INTERVIEWS WITH PLANT MANAGEMENT
H. INTERVIEWS WITH OPERATING PERSONNEL
I. INTERVIEWS WITH THIRD PARTIES
J. EXTERNAL LABORATORY TESTING
K. CAMERAS

Describe other methods not listed _____

_____

REPORTING

38. Are "audit" results presented orally or in a written report?

A. ORALLY
B. WRITTEN
C. BOTH

→ (if B or C) What is the typical length of the written report?
_____

→ (if A) Who are the results presented to? _____

_____

_____

GO TO QUESTION 42

39. Who is the primary addressee of the final report?

A. PLANT MANAGER
B. CHIEF EXECUTIVE OFFICER
C. PRESIDENT

Other not listed? _____

40. Who else is the final report distributed to?

A. _____

B. _____

C. _____

41. What types of information are presented in the final audit report?

_____

_____

_____

42. What is the average length of time between the on-site investigation and the presentation of audit results?

_____

43. Are "audit" results considered to be sensitive proprietary information?

A. NO
B. YES

44. Has your company taken legal safeguards to protect "audit" results from third party discovery? (for example, solicitor-client privilege)

A. NO
B. YES

→ (if B) Please specify _____

_____

45. Does your company have a formal procedure for responding to the final "audit" report?

A. NO
B. YES

→ (if B) Who responds? _____

How long after receiving the report? _____

46. Who designs corrective measures ("action plans") for deficiencies or problems identified by the "audit"?

A. AUDIT MANAGER/TEAM
B. PLANT MANAGEMENT
C. COMBINATION OF ABOVE

→ (if B or C) Does the audit manager/team require the submission of proposed corrective measures for its review and/or approval?

A. NO
B. YES

47. Does the audit manager/team perform formal routine checks to determine whether identified deficiencies have been corrected?

A. NO
B. YES

(if B) How often? _____

(if A) Does the audit manager/team require that plant management submit "progress reports" regarding corrective action?

A. NO
B. YES

48. How is the success of your "audit" program evaluated?

_____

_____

_____

49. Have your "audits" identified areas for potential cost savings?

A. NO
B. YES

(if B) What? _____

_____

50. Experience with many firms indicates that "environmental auditing" often results in benefits over and above those achieved as a direct result of audit objectives. What indirect or unintended benefits did your "audit" program result in?

_____

_____

51. In your opinion, does environmental auditing result in improved compliance with environmental regulations?

A. NO
B. PROBABLY NOT
C. PROBABLY
D. YES

52. Do you think other companies could benefit by the use of "environmental auditing" or similar procedures?

A. NO
B. PROBABLY NOT
C. PROBABLY
D. YES

53. Is there a need for environmental auditing?

A. NO
B. YES

54. Do you think other companies should be encouraged to develop environmental auditing programs?

A. NO
B. YES

55. Do you think the number of firms with "auditing" programs will increase or decrease over the next 5 years?

A. INCREASE
B. DECREASE
C. REMAIN THE SAME

56. The United States Environmental Protection Agency has expressed a strong interest in using environmental auditing as part of regulatory reform. EPA has considered both a mandatory third party auditor scheme (similar in structure to external financial auditing) and a voluntary 'incentive-based' scheme which would have rewarded firms that voluntarily established auditing programs and corrected identified problems.

Using the scale given below, indicate your opinion regarding each of the possible Canadian government initiatives listed below.

1. Strongly oppose
2. Mildly oppose
3. Neither oppose nor support
4. Mildly support
5. Strongly support

A. FUND RESEARCH PROJECTS AIMED AT PROMOTING THE ENVIRONMENTAL AUDITING STATE-OF-THE-ART 1 2 3 4 5

B. SPONSOR ENVIRONMENTAL AUDITING CONFERENCES AND WORKSHOPS 1 2 3 4 5

C. ACT AS A "CLEARINGHOUSE" ON AUDITING PRACTICES TO HELP COMPANIES LEARN FROM ONE ANOTHER 1 2 3 4 5

D. SUPPORT AND PUBLICLY ENDORSE PRIVATE SECTOR AUDITING EFFORTS 1 2 3 4 5

E. DEVELOP A VOLUNTARY 'INCENTIVE BASED' PROGRAM SIMILAR TO THE U.S. EPA'S . . . 1 2 3 4 5

F. DEVELOP A MANDATORY, THIRD-PARTY SCHEME SIMILAR TO EXTERNAL FINANCIAL AUDITING 1 2 3 4 5

59. Would you like a copy of my earlier work on environmental auditing
Environmental Auditing - A Review of Current Practice

A. NO
B. YES

60. Would you like a copy of this research?

A. NO
B. YES

NOTE: IF REPORT(S) IS TO BE SENT TO SOMEONE OTHER THAN ADDRESSED ON COVER LETTER, PLEASE PROVIDE DETAILS:

COMMENTS

APPENDIX 3

Covering Letter

February 12, 1984

Dear Mr. _____

Environmental auditing is a management tool used by a growing number of firms like your own to increase the certainty and effectiveness by which environmental activities are managed. While there is considerable use of this tool by U.S. firms, little is known about Canadian industry's level of awareness and application of environmental auditing, about the characteristics of existing programs or about industry's general opinion regarding the value of and need for environmental auditing.

As part of the research for my masters degree Major Paper, I am conducting an investigation into the use of environmental auditing in Canada. Yours in one of several companies across Canada whose input to this investigation is being sought. In order to obtain a true representation of Canadian industry and to increase the value of this study, it is important that you complete and return the enclosed questionnaire.

You may be assured of complete confidentiality: the name of your company will never be disclosed. The questionnaire has an identification number so that I may check you name off the mailing list when your questionnaire is returned.

Expenses for conducting this survey are being paid for through a research contract between York University and the federal Department of Environment.

It is hoped that this research will lead to a greater understanding of environmental auditing and of the opportunities its use offers Canadian business. If you would like a copy of the final report, please indicate so on the questionnaire.

Please do not hesitate to write or call me. Thank you for your assistance.

John W. Reed

APPENDIX 4

Description of Environmental Auditing - An Overview

An "environment audit" is a routine and systematic review of the various controls, programs and facilities that a corporation employs at its operating plants to protect the environment and public health. Also called "environmental review", "environmental surveillance", and "compliance monitoring", the environmental auditing process includes the gathering and evaluation of information regarding the status and effectiveness of these environmental protection activities. The audit serves to diagnose these activities by detecting and identifying weakspots, potential problems and further needs. It also provides a verification that facilities are operating in compliance with legal requirements, corporate policies and good operating practices. Audit findings are usually presented to plant-level as well as corporate management.

In the area of environmental monitoring, an environmental audit might consist of routine checks to ensure that monitoring data is accurate, complete and is collected in accordance with regulatory requirements, that appropriate record keeping, reporting and notification procedures are adhered to and that pollution control, monitoring and testing devices are functioning properly. It might also examine operating units and practices, facility inputs and outputs, hazardous substances, waste disposal, transportation, worker safety and health, employee training programs and awareness, emergency response, contingency planning, and so on.

Individual environmental auditing programs vary in their objectives, scope, staffing, procedures and reporting. Some are aimed at verifying compliance for top management; others serve as on-line, plant level management tools. Some are "full-blown" comprehensive audits; others are more selective, focussing on specific regulations, substances, media effects or operating units. Some are conducted out of operating divisions; others from corporate. Some use plant or division personnel; others use corporate personnel; others still use outside consultants. Some pre-announce the on-site visit; others operate on a surprise basis. The range of mechanisms for communicating, validating and following up on audit results is equally diverse.

In addition to those functions described above, an environmental audit can: provide an early warning of environmental problems and prevent surprises; identify areas for potential cost savings; reduce exposure to corporate liability; improve communication between plant and corporate management; enhance employee awareness of environmental concerns. In total, environmental auditing can lead to an increase in the certainty and effectiveness by which a firm's environmental activities are managed and an improvement in its overall environmental performance.

APPENDIX 5

Abstract of Phase 1 Report

Environmental Auditing - A Review of Current Practice

John W. Reed

Environmental Auditing: A Review of Current Practice provides a comprehensive overview of the environmental auditing state-of-the-art. It synthesizes the experiences and positions of a number of active constituencies, primarily U.S. based, including private corporations, trade associations, government agencies, consultants, lawyers, academics and others. Specific topics addressed include:

* What an environmental audit is
* Environmental audit information and the functions it serves
* Environmental audit conventions and principles
* Steps in conducting an environmental audit including:
    * determining objectives
    * audit design, scope and targeting
    * audit team staffing and organization
    * pre-audit preparation
    * on-site investigation
    * audit reporting
    * follow up
* Benefits of environmental auditing to:
    * implementing firms
    * the environment and public
* Barriers to implementation
* Environmental audit confidentiality
* Environmental auditing as a regulatory concept - U.S. EPA's experience.

If you would like a copy of this report, please indicate so on the enclosed questionnaire.

APPENDIX 6

Follow Up Letter

Dear Mr. _____

In early March, I mailed you a questionnaire regarding your company's use of internal environmental auditing.

If your questionnaire has been returned to me since the mailing of this letter, please disregard it and accept my sincere thanks for participating in my study.

If it has not, I would appreciate your taking the time necessary to complete and return it. That questionnaire is an important feature of my masters degree research into Canadian industry's use of and general attitude toward the practice of environmental auditing. Your input into my study is essential in order to get a good cross-section of your industry and to enhance the overall value and utility of my work.

If you require an additional copy of the questionnaire, or would like further information, please do not hesitate to contact me.

Your assistance and participation is very much appreciated.

Thank you.

Sincerely,

John W. Reed

SELECTED BIBLIOGRAPHY

A. D. Little, Center for Environmental Assurance, Environmental Auditing and the Smaller Company. Workshop Papers given at the Erie County Environmental Audit Workshop. Buffalo, New York: October 13, 1983.

A. D. Little, Center for Environmental Assurance, Environmental Audit Reporting. A Study of Current Practices. Cambridge, Massachusetts. 1982.

A. D. Little, Center for Environmental Assurance, A Survey of Environmental Auditing Programs. Cambridge, Massachusetts. 1980.

Anon. "Review Programs Help Companies Meet Environmental Obligations", Chemecology, Chemical Manufacturers Association, July/August, p.12, 1982.

Anon. "The Exploding Market For Environmental Audits". Business Week, June 16. p.92B-H, 1983.

Atlantic Richfield Company, Health Safety and Environmental Protection Council, "Environmental Protection Systems Review Program", Los Angeles, California. 1983.

Bardach, Eugene and Lucian Pugliaresi. "The Environmental Impact Statement vs. The Real World" Public Interest, Fall, 1977.

Basta, Michael F. "A Utility's Experience with an Environmental Quality Assessment Program". Paper presented at 76th Annual APCA Meeting. Atlanta, Georgia. 1983.

Beer, Stafford. Brain of the Firm. London: Allen Lane: The Penguin Press, 1972.

Blumenfeld, Karen. "Remarks of Karen Blumenfeld", Speech given at the Environmental Liability Management Conference, October 28, 1982. United States Environmental Protection Agency. Washington, D. C. 1982.

Blumenfeld, Karen and Haddad, Mark. "Beyond the Battleground: A (Non)Regulatory Perspective on Environmental Auditing.". Regulatory Reform Staff. U.S. Environmental Protection Agency. Washington, D. C. March 1, 1983.

Brusson, Carol. 1984. "Environmental Projects Top $284 Million in '84". Paper Trade Journal, April 15, 1984.

Calder, Bobby J. 1983. "Perceptions of Environmental Auditing - A Market Research Analysis". Northwestern University, Evanston, Illinois.

Cannon, Joseph A. "Trust Everyone -- But Cut the Cards. Environmental Self-Regulation and Corporate Responsiveness." United States Environmental Protection Agency, Washington, D. C. 1982.

Chemical Manufacturers Association. "Development and Use of Environmental Audit Programs Within the Chemical Industry". Washington, D. C. 1983.

Clark, Edwin H., II. "Environmental Auditing Programs: Benefits to the Environment and Government". Sterling Hobe Corporation. 1983.

Cutler, Robert W. "Environmental Auditing: The Keystone to a Management Compliance, Control and Risk Assessment Program", in Environmental Analyst, Vol. 3, No. 5, pp.12-16. April 1982.

Decker, Lawrence R. "A Hierarchy of Safety and Health Program Elements". Professional Safety. January, 1984.

Dillman, Donald. Mail and Telephone Surveys: A Total Design Method. Washington State University, 1982.

Downing, Donna, 1984. "Environmental Auditing Bibliography". U.S. Environmental Protection Agency, Washington, D.C.

Edison Electric Institute. 1983. Environmental Auditing Workbook. Washington, D.C.

Edison Electric Institute. 1982. "Utility Survey, Summary Findings of Environmental Auditing Questionnaires". Edison Electric Institute, Washington, D.C.

Environmental Audit Letter. Vol. 1, No. 1 to 0, Harrison Publications: New York, 1983/1984.

Environmental Law Institute, 1984. "An Introduction to Environmental Auditing" prepared for The Michigan Department of Natural Resources.

Environmental Protection Agency, 1983. "Environmental Auditing Opinion Leaders Workshop". Washington, D.C. (Summary of proceedings).

Fleckenstein, Leonard J. "Environmental Auditing: Prospective Policy Directions". Regulatory Reform Staff. U.S. Environmental Protection Agency. Nov. 17, 1983.

Fleckenstein, Leonard J. 1984. "Environmental Auditing: A Management Tool and Potential Regulatory Reform" U.S. Environmental Protection Agency, Washington, D.C.

Gibson, Michael M. and Fahrenthold, Paul D. "New Perspectives on Corporate Risk and Ways to Reduce it", in The Environmental Forum, Vol. 1, No. 11, pp.35-41. March, 1983.

Government Institutes Inc., Environmental Compliance Audit Seminar. Rockville, Maryland. 1982.

Guida, Joseph F. "A Practical Look at Environmental Audits" in Journal of the Air Pollution Control Association. Vol. 32, No. 5, pp.568-574. May, 1982.

Haas, Brenda, H. 1982. "Industrial Hygiene Audits" American Industrial Hygiene Association Journal. December 1982. p.867-873.

Helms, R.F. "Kimberly-Clark Corporation's Environmental Inspection (Audit) Program". Neenah, Wisconsin. 1984.

Henz, Donald J., "Safeguarding Confidential Business Information", paper presented at 76th Annual APCA Meeting, Atlanta, Georgia. 1983.

Institute for Environmental Studies, University of North Carolina. "Analytic Support for Environmental Auditing Scheme for North Carolina: Task 1 Report". Chapel Hill, North Carolina. 1983A.

Institute for Environmental Studies, University of North Carolina. "Analytic Support for Environmental Auditing Scheme in North Carolina: Task 2 Report". Chapel Hill, North Carolina. 1983B.

Kane, Raymond W., "Designing A Good Corporate Program for Environmental Management and Compliance" in, The Environmental Forum, Vol. 1, No. 6, pp.18-27. October, 1982.

MacIntyre, Stephen T., "The Role of Environmental Auditing for Industry and Regulators". Paper presented at the 76th Annual APCA Meeting. Atlanta, Georgia, 1983.

Marcus, Alfred A. and Nadel, Mark V., "Can You Trust Your Environmental Auditing Program? Organizational Issues in Establishing and Improving Environmental Auditing Programs". Battelle Memorial Institute: Seattle, Washington, 1983.

McKay, Laurel "Environmental Information Management in the Energy Resource Industry" University of Calgary, Faculty of Environmental Design, Calgary, Alta. June, 1983.

McKay, Laurel and Dixon, Thompson. "Management Problems in/of Environmental Science" University of Calgary, Faculty of Environmental Design, Calgary, Alta. December, 1983.

National Enforcement Investigations Centre. 1983. Multi-Media Compliance Audit Inspection Procedures. U.S. Environmental Protection Agency, Denver, Colorado.

National Institutes of Health. Unreleased Contract Scope of Work, Bethesda, Maryland. 1984.

North Carolina Department of Natural Resources and Community Development, 1983. "Environmental Auditing and North Carolina: Regulators Encourage Use of a Catalyst for Environmental Protection".

O'Rordan, John. "Experience in Environmental Planning in British Columbia". B.C. Ministry of Environment, March, 1984.

O'Rourke, James T. Camp, Dresser and McKee, "Engineering an Environmental Audit". Boston, Massachusetts, 1983.

Palmisano, John. "The Evolution of Environmental Auditing: Implications for Firms and for Regulators". United States Environmental Protection Agency, Washington, D. C. 1983.

Peat Marwick and Partners and W.A. Sims, "Economic Incentive Policy Instruments to Implement Pollution Control Objectives in Ontario". Toronto, Ontario, July, 1983.

Penna, Richard A. "Environmental Auditing: The Policy and the Prospects", in The Environmental Forum, Vol. 2, No. 1, pp.1620. May, 1983.

Pizzi, F. P., "Assessing Environmental Risks", Hydrocarbon Processing, p.253-255, April 1982.

Porter, W. Thomas Jr., and Burton, John C. Auditing: A Conceptual Approach. Wadsworth Publishing Company, Inc.: Belmont, California, 1971.

Razer, George R. 1983. "Environmental Surveillance: Allied Chemical Company's Approach". Allied Chemical Company.

Reed, Phillip, D. "Environmental Audits and Confidentiality. Can What You Know Hurt You as Much as What You Don't Know?" Environmental Law Reporter: News and Analysis. 13 ELR 10303-10308. 1983.

Reed, John W. "Environmental Auditing, A Review of Current Practice" York University, Downsview, Ontario, 1984.

Reich, Robert B. "The Fourth Wave of Regulation". The McKinsey Quarterly Winter, 1983.

Sawyer, Lawrence B. The Practice of Modern Internal Auditing, Second Edition. The Institute of Internal Auditors, Inc.: Florida, 1981.

Schein, Edgar H. Process Consultation: Its Role In Organizational Development. Massachusetts Institute of Technology: Addison-Wesley Publishing Company, 1969.

Smith, Marty. 1984. "Promotion of Environmental Auditing Through State-Level Initiative: The North Carolina Saga Continues". University of North Carolina. Chapel Hill, N.C.

Splendore, John L., "The How and Why of Environmental Audits". Industrial Wastes, March/April, 1983.

Thompson, Dickson. "A Conserver Society, Grounds for Optimism" Alternatives, Vol. II, No. i Fall, 1982.

Truitt, Thomas H., Berz, David R., Weinberg, David B., Molloy, J. Brian, Price, Gary L., Florence, B. Thomas, and Truitt, Leslie S. Environmental Audit Handbook - Basic Principles of Environmental Compliance Auditing. Wald, Harkrader and Ross: Washington, D. C. 1981.

U.S. Environmental Protection Agency, Regulatory Reform Staff, "Environmental Auditing Opinion Leaders; Workshop: Proceedings". Washington, D. C. 1983.

Weiss, Malcolm C. "Environmental Auditing and Related Compliance Management Systems Bibliography", First Edition, E.P.A., Washington, D. C. 1983.

Weiss, Malcolm C. "Issues of Confidentiality and Disclosure in Environmental Auditing" U.S. Environmental Protection Agency, Washington, D. C. November, 1983.

Wilkenfeld, Jerome, "Environmental Auditing" Occidental Petroleum Corporation, Los Angeles, California. 1983.